The Foreign Corrupt Practices Act prohibits

A. Bribes to all foreigners.
B. Small bribes to foreign officials that serve as facilitating or grease payments.
C. Bribery only by corporations and their representatives.
D. Bribes to foreign officials to influence official acts.

- Answer (A) is incorrect because Bribes to all foreigners is not covered by the provisions in the FCPA.
- Answer (B) is incorrect because Small bribes to foreign officials that serve as facilitating or grease payments is not covered by the provisions in the FCPA.
- Answer (C) is incorrect because All U.S. firms are subject to the anti-bribery provisions.
- Answer (D) is correct. The Foreign Corrupt Practices Act (FCPA) prohibits any U.S. firm from making bribes to foreign officials to influence official acts. The businesses subject to the FCPA include corporations, partnerships, limited partnerships, business trusts, and unincorporated organizations. Violations of the FCPA are federal felonies. The penalties are up to 5 years in prison or up to a $100,000 fine or both for an officer, director, or shareholder who helps make the bribe.

A major impact of the Foreign Corrupt Practices Act of 1977 is that registrants subject to the Securities Exchange Act of 1934 are now required to

A. Keep records that reflect the transactions and dispositions of assets and to maintain a system of internal accounting controls.
B. Provide access to records by authorized agencies of the federal government.
C. Prepare financial statements in accord with international accounting standards.
D. Produce full, fair, and accurate periodic reports on foreign commerce and/or foreign political party affiliations.

- Answer (A) is correct. The main purpose of the Foreign Corrupt Practices Act of 1977 is to prevent bribery by firms that do business in foreign countries. A major ramification is that it requires all companies that must register with the SEC under the Securities Exchange Act of 1934 to maintain adequate accounting records and a system of internal accounting control.
- Answer (B) is incorrect because Authorized agents of the federal government already have access to records of SEC registrants.
- Answer (C) is incorrect because Although some international accounting standards have been promulgated, they are incomplete and have not gained widespread acceptance.
- Answer (D) is incorrect because There are no requirements for providing periodic reports on foreign commerce or foreign political party affiliations.

The reporting of accounting information plays a central role in the regulation of business operations. The importance of sound internal control practices is underscored by the Foreign Corrupt Practices Act of 1977 which requires publicly owned U.S. corporations to maintain systems of internal control that meet certain minimum standards. Preventive controls are an integral part of virtually all accounting processing systems, and much of the information generated by the accounting system is used for preventive control purposes. Which one of the following is not an essential element of a sound preventive control system?

A. Separation of responsibilities for the recording, custodial, and authorization functions.
B. Sound personnel practices.
C. Documentation of policies and procedures.
D. Implementation of state-of-the-art software and hardware.
Answer (A) is incorrect because Segregation of functions makes it more difficult for one person both to perpetrate and conceal an irregularity.
Answer (B) is incorrect because Hiring honest and capable employees prevents many problems.
Answer (C) is incorrect because Documentation provides a guide for conduct.
Answer (D) is correct. Preventive controls are designed to prevent an error or irregularity from occurring. State-of-the-art hardware and software would presumably incorporate the latest control features, but a less advanced system could very well contain a sound preventive control structure. Hence, state-of-the-art components are not essential for effective control.

[4] What law prohibits U.S. companies from paying bribes to foreign officials for the purpose of obtaining or retaining business?

A. Federal Ethical Standards Act.
B. Robinson-Patman Act.
C. Foreign Corrupt Practices Act.
D. North American Free Trade Agreement.

Answer (A) is incorrect because The Federal Ethical Standards Act does not deal with international payments.
Answer (B) is incorrect because The Robinson-Patman Act of 1936 prohibits price discrimination.
Answer (C) is correct. The Foreign Corrupt Practices Act of 1977 prohibits bribes to foreign officials for purposes of obtaining or retaining business. The Act also requires companies to maintain effective systems of internal control.
Answer (D) is incorrect because The North American Free Trade Agreement (NAFTA), passed in 1993, provides for free trade among the nations of Canada, Mexico, and the U.S.

[5] Which of the following is not an aspect of the Foreign Corrupt Practices Act of 1977?

A. It subjects management to fines and imprisonment.
B. It prohibits bribes to foreign officials.
C. It requires the establishment of independent audit committees.
D. It requires an internal control system to be developed and maintained.

Answer (A) is incorrect because This is a provision of the Act.
Answer (B) is incorrect because This is a provision of the Act.
Answer (C) is correct. The Foreign Corrupt Practices Act of 1977 prohibits bribes to foreign officials and requires firms to have adequate systems of internal control. Violation of the Act subjects individual managers to fines and/or imprisonment. The Act does not specifically require the establishment of audit committees, but many firms have established audit committees as one means of dealing with the internal control provisions of the Act.
Answer (D) is incorrect because This is a provision of the Act.
Firms subject to the reporting requirements of the Securities Exchange Act of 1934 are required by the Foreign Corrupt Practices Act of 1977 to maintain satisfactory internal control. The role of the independent auditor relative to this Act is to

A. Report clients with unsatisfactory internal control to the SEC.
B. Provide assurances to users as part of the traditional audit attest function that the client is in compliance with the present legislation.
C. Express an opinion on the sufficiency of the client’s internal control to meet the requirements of the Act.
D. Attest to the financial statements.

- Answer (A) is incorrect because The auditor is not required to report violations of the Act to the SEC, although a duty to disclose outside the client may exist in some circumstances; e.g., the client’s failure to take remedial action regarding an illegal act may constitute a disagreement that it must report on Form 8-K (AU 317).
- Answer (B) is incorrect because The traditional attest function does not involve compliance auditing.
- Answer (C) is incorrect because The FCPA contains no requirement that an auditor express an opinion on internal control.
- Answer (D) is correct. Whether a client is in conformity with the Foreign Corrupt Practices Act is a legal question. Auditors cannot be expected to provide clients or users of the financial statements with legal advice. The role of the auditor is to assess control risk in the course of an engagement to attest to the fair presentation of the financial statements.

The requirement of the Foreign Corrupt Practices Act of 1977 to devise and maintain adequate internal control is assigned in the Act to the

A. Chief financial officer.
B. Board of directors.
C. Director of internal auditing.
D. Company as a whole with no designation of specific persons or positions.

- Answer (A) is incorrect because Compliance with the FCPA is not the specific responsibility of the chief financial officer.
- Answer (B) is incorrect because Compliance with the FCPA is not the specific responsibility of the board of directors.
- Answer (C) is incorrect because Compliance with the FCPA is not the specific responsibility of the director of internal auditing.
- Answer (D) is correct. The accounting requirements apply to all public companies that must register under the Securities Exchange Act of 1934. The responsibility is thus placed on companies, not individuals.

Which of the following corporations are subject to the accounting requirements of the Foreign Corrupt Practices Act (FCPA)?

A. All corporations engaged in interstate commerce.
B. All domestic corporations engaged in international trade.
C. All corporations that have made a public offering under the Securities Act of 1933.
D. All corporations whose securities are registered pursuant to the Securities Exchange Act of 1934.

- Answer (A) is incorrect because The accounting requirements apply only to publicly held companies registered under the 1934 act.
- Answer (B) is incorrect because The accounting requirements apply only to publicly held companies registered under the 1934 act.
Answer (C) is incorrect because The accounting requirements apply only to publicly held companies registered under the 1934 act.

Answer (D) is correct. The accounting requirements of the FCPA apply to all companies required to register and report under the Securities Exchange Act of 1934. These companies must maintain books, records, and accounts in reasonable detail that accurately and fairly reflect transactions. The FCPA also requires these companies to maintain a system of internal accounting control that provides certain reasonable assurances, including that corporate assets are not used for bribes.

The Foreign Corrupt Practices Act of 1977 prohibits bribery of foreign officials. Which of the following statements correctly describes the act’s application to corporations engaging in such practices?

A. It applies only to multinational corporations.
B. It applies to all domestic corporations engaged in interstate commerce.
C. It applies only to corporations whose securities are registered under the Securities Exchange Act of 1934.
D. It applies only to corporations engaged in foreign commerce.

Answer (A) is incorrect because The FCPA antibribery provisions apply to all corporations engaged in interstate commerce (and also to any form of business organization, not just to corporations).

Answer (B) is correct. Although the requirements of the FCPA relating to the maintenance of accounting records and systems of internal accounting control apply only to companies required to register under the Securities Exchange Act of 1934, the antibribery provisions apply to all domestic business concerns engaged in interstate commerce.

Answer (C) is incorrect because Although the requirements of the FCPA relating to the maintenance of accounting records and systems of internal accounting control apply only to companies required to register under the Securities Exchange Act of 1934, the antibribery provisions apply to all domestic business concerns engaged in interstate commerce.

Answer (D) is incorrect because The FCPA antibribery provisions apply to all corporations engaged in interstate commerce (and also to any form of business organization, not just to corporations).

Under the Foreign Corrupt Practices Act (FCPA), an action may be brought that seeks

A. Treble damages by a private party.
B. Injunctive relief by a private party.
C. Criminal sanctions against both the corporation and its officers by the Department of Justice.
D. Damages and injunctive relief by the Securities and Exchange Commission.

Answer (A) is incorrect because Private parties may not bring an action under the FCPA.

Answer (B) is incorrect because Private parties may not bring an action under the FCPA.

Answer (C) is correct. The SEC may investigate violations of the FCPA, bring civil actions for its enforcement, and recommend that the Justice Department prosecute criminal violations.

Answer (D) is incorrect because Although the SEC is empowered to seek injunctions, the Justice Department must seek penalties. Damages are sought by private parties who cannot sue under this statute.
The U.S. Foreign Corrupt Practices Act is particularly focused on the dealings of financial institutions and the safeguarding of the global financial system. Financial institutions must implement robust controls to ensure knowledge of their customers and the nature of their business transactions and be in a position to prove to regulators a high level of due diligence. These safeguards are required to minimize all of the following except

A. Money laundering.
B. Insider trading.
C. Terrorist financing.
D. Extortion and bribery.

- Answer (A) is incorrect because Money laundering is one focus of the safeguards of the global financial system relating to the U.S. Foreign Corrupt Practices Act.
- Answer (B) is correct. The safeguards of the global financial system relating to the U.S. Foreign Corrupt Practices Act deal with minimizing money laundering, terrorist financing, and extortion and bribery. Insider trading is not a focus of the safeguards.
- Answer (C) is incorrect because Terrorist financing is one focus of the safeguards of the global financial system relating to the U.S. Foreign Corrupt Practices Act.
- Answer (D) is incorrect because Extortion and bribery are focuses of the safeguards of the global financial system relating to the U.S. Foreign Corrupt Practices Act.

Corporations have the responsibility to issue financial statements that are timely, accurate, and transparent, reflecting all the transactions of the company. Which of the following documents refer to this responsibility?

I. IMA’s Statement of Ethical Professional Practice
II. SOX Section 406: Code of Ethics for Senior Financial Officers
III. IMA’s Statement on Management Accounting “Values and Ethics: From Inception to Practice”
IV. U.S. Foreign Corrupt Practices Act

- Answer (A) is incorrect because The IMA’s Statement of Ethical Professional Practice discusses ethical principles and standards that should be followed by members of the IMA. This does not refer to the responsibility to issue financial statements that are timely, accurate, and transparent, reflecting all the transactions of the company.
- Answer (B) is incorrect because The IMA’s Statement on Management Accounting “Values and Ethics: From Inception to Practice” is a useful document for understanding ethical concepts in an organizational context. This does not refer to the responsibility to issue financial statements that are timely, accurate, and transparent, reflecting all the transactions of the company. The IMA’s Statement of Ethical Professional Practice discusses ethical principles and standards that should be followed by members of the IMA. This does not refer to the responsibility to issue financial statements that are timely, accurate, and transparent, reflecting all the transactions of the company.
- Answer (C) is incorrect because The IMA’s Statement on Management Accounting “Values and Ethics: From Inception to Practice” is a useful document for understanding ethical concepts in an organizational context. This does not refer to the responsibility to issue financial statements that are timely, accurate, and transparent, reflecting all the transactions of the company.
- Answer (D) is correct. SOX Section 406: Code of Ethics for Senior Financial Officers and the U.S. Foreign Corrupt Practices Act both refer to the corporate responsibility to issue financial statements that are timely, accurate, and transparent, reflecting all the transactions of the company.
IMA’s Statement on Management Accounting, “Values and Ethics: From Inception to Practice,” recommends a defined code of conduct and ethical behavior for all organizations. One advantage of having such a code is that it

A. Provides employees with guidance for handling unfamiliar situations.
B. Ensures ethical behavior by all employees.
C. Shields the organization from liability in cases of loss of stockholder value due to fraud.
D. Eases the investigative process performed by police and prosecutors in cases of suspected fraud.

- Answer (A) is correct. “Values and Ethics: From Inception to Practice” states, in part, “... what does an employee do when unplanned events occur? What reference does an individual look to for help in making decisions? ... This is why it is important to have a defined set of organizational values and code of ethics – they create the ‘touchstone’ against which every unanticipated decision must be judged. Failure to have every individual in the organization know and understand these values and ethical code leads to inconsistency and, in the worst cases, unethical or fraudulent behavior.” (IV. Values, Ethics, and Accounting.)
- Answer (B) is incorrect because a code of conduct cannot guarantee ethical behavior by employees.
- Answer (C) is incorrect because a code of conduct cannot guarantee that an organization will be shielded from liability in cases of fraud.
- Answer (D) is incorrect because a code of conduct does not ease law enforcement’s investigative process.

Which one of the following is a true statement regarding organizational ethics?

A. As long as officer and employee behavior meet the requirements of the law, the organization can be considered to have a functioning system of ethical behavior.
B. A strong sense of ethics on the part of employees who are in the best position to appropriate cash and other assets is the most vital part of a functioning system of ethical behavior.
C. Paying attention to “whistleblowers” plays a significant role in maintaining an effective ethical atmosphere.
D. Answer (A) is incorrect because a sense of ethics requires an ability to distinguish between ethical and merely legal behavior. “Values and Ethics: From Inception to Practice” states, in part, “Many individuals at the center of corporate scandals [of the late 20th and early 21st Century] have professed the belief that they were innocent of any wrongdoing, including Kenneth Lay of Enron or Conrad Black of Hollinger. The problem is that these individuals did not define their behavior by what most of society would see as ‘reasonable,’ but rather they followed their own particular code – in some cases, limiting the definition of ethical behavior to require compliance with the law and nothing more.” (II. Introduction.)
- Answer (B) is incorrect because “Values and Ethics: From Inception to Practice” states, in part, “Ethical behavior is not something that applies to someone else – every single individual is responsible for behaving ethically. Nowhere is this more important than the demonstration of ethical behavior that managers and supervisors exhibit in the way they execute their day-to-day work...” This phenomenon is referred to as the “tone at the top.” (VI. Leadership by Example.)
- Answer (C) is incorrect because employee training is important to maintaining an ethical organizational culture. “Values and Ethics: From Inception to Practice” states, in part, “Every existing member of staff should receive ongoing training, starting at the board level and cascading down throughout the organization... Ethics training for employees should focus on covering ethical concepts, the organization’s code, and compliance. To achieve this, training should include: ethical concepts and thinking: What is ‘behind’ the issue of ethical action?; [and] the organization’s code of ethics and any supporting ‘rules.’” (VIII. Practical Application: Converting Intent into Operational Reality.)
- Answer (D) is correct. “Values and Ethics: From Inception to Practice” states, in part, “A whistleblowing framework (e.g., an ethics helpline) is an important component in maintaining an ethical organizational culture. An effective feedback system includes having a confidential framework for employees to report possible violations of the organization’s code of ethics and to receive advice on the ethical aspects of challenging decisions. Statistics show that a large number of occupational fraud cases are detected through an employee “hotline” or other reporting method...” (IX. Measuring and Improving Ethical Compliance.)
Which one of the following is a true statement regarding organizational ethics?

A. A comprehensive framework of corporate ethical behavior is a prerequisite for an effective system of internal control.
B. An effective system of internal control is a prerequisite for corporate ethical behavior.
C. If a functioning system of ethical behavior is in place, an organization is able to devote fewer resources to developing human capital.
D. “Organizational culture” is determined mostly by the industry(ies) in which the firm operates.

- Answer (A) is correct. A comprehensive framework of corporate ethical behavior is a prerequisite for an effective system of internal control. “Values and Ethics: From Inception to Practice” states, in part, “CEOs and CFOs have to place their own integrity on the line by attesting to compliance with an adequate level of internal controls (as well as all other certifications). Creating a thorough, integrated system for developing, implementing, sustaining, and monitoring ethical performance within the organization will allow executives to make such declarations with confidence that a code of ethics is the foundation of the organization’s culture and is fully integrated into the thinking process of every employee and business partner.” (IX. Measuring and Improving Ethical Compliance.)
- Answer (B) is incorrect because it is more nearly true to state the opposite.
- Answer (C) is incorrect because the concept of “human capital” is important to an organization in creating a climate where “doing the right thing” is expected. In most organizations today, labor costs constitute the majority of operating expenses. “Values and Ethics: From Inception to Practice” states, in part, “…an organization must, to a great degree, trust that its employees are acting in its best interests. Human ‘capital’ is a critical asset. Unmotivated employees can poison the atmosphere and reduce the teamwork and cooperation required for knowledge transfer and innovation, and they can have a significant negative impact on relationships with suppliers and customers.” (IV. Values, Ethics, and Accounting.)
- Answer (D) is incorrect because “Values and Ethics: From Inception to Practice” states, in part, “Every organization already has a culture where ‘doing the right thing’ is expected. In most organizations today, labor costs constitute the majority of operating expenses. ‘Values and Ethics: From Inception to Practice’ states, in part, “…an organization must, to a great degree, trust that its employees are acting in its best interests. Human ‘capital’ is a critical asset. Unmotivated employees can poison the atmosphere and reduce the teamwork and cooperation required for knowledge transfer and innovation, and they can have a significant negative impact on relationships with suppliers and customers.” (IV. Values, Ethics, and Accounting.)

The basic financial statements include:

A. Balance sheet, income statement, statement of retained earnings, and statement of changes in retained earnings.
B. Statement of financial position, income statement, statement of retained earnings, and statement of changes in retained earnings.

- Answer (A) is incorrect because the statement of changes in retained earnings is not a separate financial statement.
- Answer (B) is incorrect because the statement of changes in retained earnings is not a separate financial statement.
- Answer (C) is incorrect because the statement of changes in retained earnings is not a separate financial statement.
- Answer (D) is correct. Under GAAP, the basic required statements are the statements of financial position, income, cash flows, and retained earnings. Changes in equity must be disclosed in the basic statements, the notes, or a separate statement. A statement of cash flows is now a required part of a full set of financial statements of all business entities (both publicly held and privately held). Moreover, comprehensive income must be displayed in a financial statement given the same prominence as other statements, but no specific format is required as long as net income is displayed as a component of comprehensive income in the statement.
Financial statement users with a direct economic interest in a specific business include

A. Financial advisers.
B. Regulatory bodies.
C. Stock markets.
D. Suppliers.

- Answer (A) is incorrect because Financial advisers have indirect interests.
- Answer (B) is incorrect because Regulatory bodies have indirect interests.
- Answer (C) is incorrect because Stock markets have indirect interests.
- Answer (D) is correct. Users with direct interests include investors or potential investors, suppliers and creditors, employees, and management.

A primary objective of external financial reporting is

A. Direct measurement of the value of a business enterprise.
B. Provision of information that is useful to present and potential investors, creditors, and others in making rational financial decisions regarding the enterprise.
C. Establishment of rules for accruing liabilities.
D. Direct measurement of the enterprise’s stock price.

- Answer (A) is incorrect because Financial reporting is not designed to measure directly the value of a business.
- Answer (B) is correct. According to the FASB’s Conceptual Framework, the objectives of external financial reporting are to provide information that (1) is useful to present and potential investors, creditors, and others in making rational financial decisions regarding the enterprise; (2) helps those parties in assessing the amounts, timing, and uncertainty of prospective cash receipts from dividends or interest and the proceeds from sale, redemption, or maturity of securities or loans; and (3) concerns the economic resources of an enterprise, the claims thereto, and the effects of transactions, events, and circumstances that change its resources and claims thereto.
- Answer (C) is incorrect because While rules for accruing liabilities are a practical concern, the establishment of such rules is not a primary objective of external reporting.
- Answer (D) is incorrect because The objectives of financial accounting are unrelated to the measurement of stock prices; stock prices are a product of stock market forces.

Notes to financial statements are beneficial in meeting the disclosure requirements of financial reporting. The notes should not be used to

A. Describe significant accounting policies.
B. Describe depreciation methods employed by the company.
C. Describe principles and methods peculiar to the industry in which the company operates, when these principles and methods are predominantly followed in that industry.
D. Correct an improper presentation in the financial statements.

- Answer (A) is incorrect because It describes an appropriate and required disclosure that should appear in the notes to the financial statements.
- Answer (B) is incorrect because It describes an appropriate and required disclosure that should appear in the notes to the financial statements.
Answer (C) is incorrect because it describes an appropriate and required disclosure that should appear in the notes to the financial statements.
Answer (D) is correct. Financial statement notes should not be used to correct improper presentations. The financial statements should be presented correctly on their own. Notes should be used to explain the methods used to prepare the financial statements and the amounts shown. The first footnote typically describes significant accounting policies.

[20] Which of the following is not a need of financial statement users?

A. Financial advisers and analysts need financial statements to help investors evaluate particular investments.
B. Stock exchanges need financial statements to set a firm’s stock price.
C. Regulatory agencies need financial statements to evaluate price changes for regulated industries.
D. Employees need financial information to negotiate wages and fringe benefits.

- Answer (A) is incorrect because financial advisers use financial statements for evaluating investments.
- Answer (B) is correct. Investors’ purchases and sales set stock prices. Stock exchanges need financial statements to evaluate whether to accept a firm’s stock for listing or whether to suspend trading in the stock.
- Answer (C) is incorrect because regulatory agencies use financial statements for rate making.
- Answer (D) is incorrect because employees use financial statements for labor negotiations.

[21] The management of ABC Corporation is analyzing the financial statements of XYZ Corporation because ABC is strongly considering purchasing a block of XYZ common stock that would give ABC significant influence over XYZ. Which financial statement should ABC primarily use to assess the amounts, timing, and uncertainty of future cash flows of XYZ Company?

A. Income statement.
B. Statement of retained earnings.
C. Statement of cash flows.
D. Balance sheet.

- Answer (A) is incorrect because the statement of income is prepared on an accrual basis and is not meant to report cash flows.
- Answer (B) is incorrect because the statement of retained earnings merely shows the reasons for changes in retained earnings during the reporting period.
- Answer (C) is correct. The primary purpose of a statement of cash flows is to provide information about the cash receipts and cash payments of a business enterprise during a period. This information helps investors, creditors, and other users to assess (1) the enterprise’s ability to generate net cash inflows; (2) its ability to meet its obligations, and pay dividends; (3) its needs for external financing; (4) the reasons for the differences between net income and net cash flow; and (5) the effects of cash and noncash financing and investing activities.
- Answer (D) is incorrect because the balance sheet reports on financial position at a moment in time. It does not provide information about future cash flows.
The primary purpose of the statement of financial position is to reflect

A. The fair value of the firm’s assets at some moment in time.
B. The status of the firm’s assets in case of forced liquidation of the firm.
C. The success of a company’s operations for a given amount of time.
D. Items of value, debt, and net worth.

- Answer (A) is incorrect because the measurement attributes of assets include but are not limited to fair value.
- Answer (B) is incorrect because financial statements reflect the going concern assumption. Hence, they usually do not report forced liquidation values.
- Answer (C) is incorrect because the income statement provides this type of information.
- Answer (D) is correct. The balance sheet presents three major financial accounting elements: assets (items of value), liabilities (debts), and equity (net worth). According to the FASB’s Conceptual Framework, assets are probable future economic benefits resulting from past transactions or events. Liabilities are probable future sacrifices of economic benefits arising from present obligations as a result of past transactions or events. Equity is the residual interest in the assets after deduction of liabilities.

Prepaid expenses are valued on the statement of financial position at the

A. Cost to acquire the asset.
B. Face amount collectible at maturity.
C. Cost to acquire minus accumulated amortization.
D. Cost less expired or used portion.

- Answer (A) is incorrect because the cost must be reduced by the expired or used portion of the prepaid asset.
- Answer (B) is incorrect because prepaid expenses will not be collected at maturity.
- Answer (C) is incorrect because prepaid expenses are not depreciated; they expire.
- Answer (D) is correct. Prepaid expenses, such as supplies, prepaid rent, and prepaid insurance, are reported on the balance sheet at cost minus the expired or used portion. These are typically current assets.
[Fact Pattern #1]
A company’s pre-closing trial balance and other pertinent information at December 31 are as follows. The opening balance of inventory was $140,000. The long-term debt pays interest at a rate of 10% per annum, payable every 12 months. The debt was issued on July 1 of the current year and originally had 5 years to maturity. The fixed assets have a 10-year estimated useful life and were 1 year old at the start of the current year. Straight-line depreciation is used by the company.

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$80,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>100,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>230,000</td>
</tr>
<tr>
<td>Gross fixed assets</td>
<td>600,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>60,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>180,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Common stock</td>
<td>210,000</td>
</tr>
<tr>
<td>Retained earnings (Jan. 1)</td>
<td>500,000</td>
</tr>
<tr>
<td>Sales revenue</td>
<td>750,000</td>
</tr>
<tr>
<td>Purchases</td>
<td>530,000</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>200,000</td>
</tr>
</tbody>
</table>

[24] (Refers to Fact Pattern #1)
The company will report year-end total assets of

A. $800,000  
B. $890,000  
C. $950,000  
D. $1,010,000

- Answer (A) is incorrect because Using the beginning balance of inventory results in $800,000.  
- Answer (B) is correct. The year-end total assets can be determined by summing all of the assets and deducting accumulated depreciation (including the current year’s depreciation). Total accumulated depreciation at the end of the second year is $120,000 ([$600,000 ÷ 10 years] × 2 years]. Total assets equal $890,000 ($80,000 cash + $80,000 A/R + $230,000 EI + $600,000 gross fixed assets − $120,000 accumulated depreciation).  
- Answer (C) is incorrect because Omitting second-year depreciation from the calculation results in $950,000.  
- Answer (D) is incorrect because Omitting total accumulated depreciation from the calculation results in $1,010,000.

[25] A statement of financial position allows investors to assess all of the following except the

A. Efficiency with which enterprise assets are used.  
B. Liquidity and financial flexibility of the enterprise.  
C. Capital structure of the enterprise.  
D. Net realizable value of enterprise assets.

- Answer (A) is incorrect because Efficiency of asset use is assessed by calculating liquidity, leverage, and asset management ratios. These ratios require balance sheet data.  
- Answer (B) is incorrect because Liquidity and financial flexibility are assessed by calculating liquidity, leverage, and asset management ratios. These ratios require balance sheet data.
Answer (C) is incorrect because the capital structure of the enterprise is reported in the equity section of the statement of financial position.

Answer (D) is correct. Assets are usually measured at original historical cost in a statement of financial position, although some exceptions exist. For example, some short-term receivables are reported at their net realizable value. Thus, the statement of financial position cannot be relied upon to assess NRV.

The accounting equation \((\text{assets} - \text{liabilities} = \text{equity})\) reflects the

A. Entity point of view.
B. Fund theory.
C. Proprietary point of view.
D. Enterprise theory.

Answer (A) is incorrect because the entity concept limits accounting information to that related to a specific entity (possibly not the same as the legal entity).

Answer (B) is incorrect because Fund theory stresses that assets equal obligations (equity and liabilities are sources of assets).

Answer (C) is correct. The equation is based on the proprietary theory. Equity in an enterprise is what remains after the economic obligations of the enterprise are deducted from its economic resources.

Answer (D) is incorrect because the enterprise concept stresses ownership of the assets; that is, the emphasis is on the credit side of the balance sheet.

Karen’s Crafts, Inc., has the following accounts included in its December 31 trial balance:

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$250,000</td>
</tr>
<tr>
<td>Discount on bonds payable</td>
<td>34,000</td>
</tr>
<tr>
<td>Wages payable</td>
<td>29,000</td>
</tr>
<tr>
<td>Interest payable</td>
<td>14,000</td>
</tr>
<tr>
<td>Bonds payable</td>
<td></td>
</tr>
<tr>
<td>(Issued 1/1/Year 1; due 1/1/Year 20)</td>
<td>500,000</td>
</tr>
<tr>
<td>Income taxes payable</td>
<td>26,000</td>
</tr>
</tbody>
</table>

What amount of current liabilities will be reported on Karen’s December 31 statement of financial position?

A. $285,000
B. $319,000
C. $353,000
D. $819,000

Answer (A) is incorrect because the discount on bonds payable is erroneously deducted from the total.

Answer (B) is correct. Current liabilities consist of those debts that will have to be paid in the coming year or the normal operating cycle, whichever period is longer. Examples include accounts payable, wages payable, interest payable, and income taxes payable. Bonds payable and its contra account, discount on bonds payable, would both be shown under the long-term liability classification. The total current liabilities would be $319,000 ($250,000 + $29,000 + $14,000 + $26,000).

Answer (C) is incorrect because the amount of $353,000 includes discount on bonds payable.

Answer (D) is incorrect because the amount of $819,000 includes bonds payable.
Perry Mansfield Corporation has the following accounts included in its December 31 trial balance:

- Accounts receivable: $110,000
- Inventories: 250,000
- Patents: 90,000
- Prepaid insurance: 19,500
- Accounts payable: 72,000
- Cash: 28,000

What amount of current assets should Perry Mansfield include in its statement of financial position at December 31?

A. $335,500  
B. $388,000  
C. $407,500  
D. $479,500  

- Answer (A) is incorrect because Deducting accounts payable from the current assets results in the amount of working capital, rather than the total of current assets.  
- Answer (B) is incorrect because It fails to include prepaid insurance in the total.  
- Answer (C) is correct. Current assets consist of cash, certain marketable securities, receivables, inventories, and prepaid expenses. Adding these elements together produces a total of $407,500 ($28,000 cash + $110,000 receivables + $250,000 inventories + $19,500 prepaid insurance).  
- Answer (D) is incorrect because It erroneously includes accounts payable.

Long-term obligations that are or will become callable by the creditor because of the debtor’s violation of a provision of the debt agreement at the balance sheet date should be classified as

A. Long-term liabilities.  
B. Current liabilities unless the debtor goes bankrupt.  
C. Current liabilities unless the creditor has waived the right to demand repayment for more than 1 year from the balance sheet date.  
D. Contingent liabilities until the violation is corrected.  

- Answer (A) is incorrect because Such obligations must be current liabilities.  
- Answer (B) is incorrect because Bankruptcy is not an exception.  
- Answer (C) is correct. Long-term obligations that are or will become callable by the creditor because of the debtor’s violation of a provision of the debt agreement at the balance sheet date normally are classified as current liabilities. However, the debt need not be reclassified if the violation will be cured within a specified grace period or if the creditor formally waives or subsequently loses the right to demand repayment for a period of more than a year from the balance sheet date (also, reclassification is not required if the debtor expects and has the ability to refinance the obligation on a long-term basis).  
- Answer (D) is incorrect because Such obligations are not contingent.
Abernathy Corporation uses a calendar year for financial and tax reporting purposes and has $100 million of mortgage bonds due on January 15, Year 2. By January 10, Year 2, Abernathy intends to refinance this debt with new long-term mortgage bonds and has entered into a financing agreement that clearly demonstrates its ability to consummate the refinancing. This debt is to be

A. Classified as a current liability on the statement of financial position at December 31, Year 1.
B. Classified as a long-term liability on the statement of financial position at December 31, Year 1.
C. Retired as of December 31, Year 1.
D. Considered off-balance-sheet debt.

- Answer (A) is incorrect because The company intends to refinance the debt on a long-term basis.
- Answer (B) is correct. Short-term obligations expected to be refinanced should be reported as current liabilities unless the firm both plans to refinance and has the ability to refinance the debt on a long-term basis. The ability to refinance on a long-term basis is evidenced by a post-balance-sheet date issuance of long-term debt or a financing arrangement that will clearly permit long-term refinancing.
- Answer (C) is incorrect because The debt has not been retired.
- Answer (D) is incorrect because The debt is on the balance sheet.

Lister Company intends to refinance a portion of its short-term debt in Year 2 and is negotiating a long-term financing agreement with a local bank. This agreement would be noncancelable and would extend for a period of 2 years. The amount of short-term debt that Lister Company can exclude from its statement of financial position at December 31, Year 1,

A. May exceed the amount available for refinancing under the agreement.
B. Depends on the demonstrated ability to consummate the refinancing.
C. Is reduced by the proportionate change in the working capital ratio.
D. Is zero unless the refinancing has occurred by year end.

- Answer (A) is incorrect because The amount excluded cannot exceed the amount available for refinancing.
- Answer (B) is correct. If an enterprise intends to refinance short-term obligations on a long-term basis and demonstrates an ability to consummate the refinancing, the obligations should be excluded from current liabilities and classified as noncurrent. The ability to consummate the refinancing may be demonstrated by a post-balance-sheet-date issuance of a long-term obligation or equity securities, or by entering into a financing agreement that meets certain criteria. These criteria are that the agreement does not expire within 1 year, it is noncancelable by the lender, no violation of the agreement exists at the balance sheet date, and the lender is financially capable of honoring the agreement.
- Answer (C) is incorrect because The correct accounting treatment does not depend on changes in ratios.
- Answer (D) is incorrect because The refinancing need not have occurred if the firm intends and demonstrates an ability to consummate such refinancing.

When treasury stock is accounted for at cost, the cost is reported on the balance sheet as a(n)

- Answer (A) is incorrect because Treasury stock is not an asset. A corporation cannot own itself.
- Answer (B) is incorrect because Treasury stock accounted for at cost is subtracted from the total of the other equity accounts.
- Answer (C) is incorrect because Treasury stock accounted for at cost is subtracted from the total of the other equity accounts.
- Answer (D) is correct. Treasury stock is a corporation’s own stock that has been reacquired but not retired. In the balance sheet, treasury stock recorded at cost is subtracted from the total of the capital stock balances, additional paid-in capital, retained earnings, and accumulated other comprehensive income.

[33] When a company was in the process of closing its original store, no accounting notice of the liquidation values of the discontinued store’s assets were considered in the accounting records. The accountant did not make any entries until the assets were disposed of because the company was still a going concern. However, when liquidation of a business is foreseen but not yet accomplished, a different financial statement is prepared. This statement is known as the

A. Statement of liquidation.
B. Charge and discharge statement.
C. Statement of realization.
D. Statement of affairs.

- Answer (A) is incorrect because The statement prepared by the trustee in bankruptcy to reconcile the book amounts to his/her administration of the estate is the statement of realization and liquidation.
- Answer (B) is incorrect because A charge and discharge statement is prepared by the personal representative of a decedent’s estate.
- Answer (C) is incorrect because The statement prepared by the trustee in bankruptcy to reconcile the book amounts to his/her administration of the estate is the statement of realization and liquidation.
- Answer (D) is correct. A statement of affairs is prepared for a company in the process of liquidation. It reflects the financial condition of the company on a going out of business rather than a going concern basis. Liquidation value instead of historical cost is used to value assets.

[34] Felicity Company has the following accounts included in its December 31 trial balance:

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treasury stock</td>
<td>$48,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>141,000</td>
</tr>
<tr>
<td>Trademarks</td>
<td>32,000</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>175,000</td>
</tr>
<tr>
<td>Common stock</td>
<td>50,000</td>
</tr>
<tr>
<td>Deferred income taxes</td>
<td>85,000</td>
</tr>
<tr>
<td>Additional paid-in capital</td>
<td>196,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>16,000</td>
</tr>
</tbody>
</table>

What amount of equity will be reported on Felicity’s December 31 statement of financial position?

A. $373,000
B. $514,000
C. $562,000
D. $610,000

- Answer (A) is incorrect because Retained earnings should be included in equity.
● Answer (B) is correct. Equity consists of contributed capital, retained earnings, and accumulated other comprehensive income. Equity accounts may therefore include retained earnings, preferred stock, common stock, and additional paid-in capital. Treasury stock is a contra account in the equity section of the balance sheet. The total is $514,000 ($141,000 + $175,000 + $50,000 + $196,000 – $48,000).
● Answer (C) is incorrect because The amount of $562,000 results from a failure to deduct treasury stock.
● Answer (D) is incorrect because Treasury stock should be deducted from, not added to, equity.

[35] Which of the following assets is normally considered the most liquid?

A. Goodwill.
B. Land.
C. Inventory.
D. Accounts receivable.

- Answer (A) is incorrect because Goodwill is an intangible asset and is classified in the long-term assets section of the balance sheet.
- Answer (B) is incorrect because Land is included in property, plant, and equipment and is not readily convertible to cash.
- Answer (C) is incorrect because Inventory takes longer to convert to cash than accounts receivable.
- Answer (D) is correct. Assets presented on the balance sheet are listed in descending order of liquidity, which allows users of financial statements to identify the assets that will be available first to meet current liabilities. An asset that is readily convertible to cash is considered very liquid. Accounts receivable typically has more liquidity than inventory and therefore is listed above inventory in the current assets section of the balance sheet.

[36] A corporation issues a balance sheet and income statement for the current year and comparative income statements for each of the 2 previous years. A statement of cash flows

A. Should be issued for the current year only.
B. Should be issued for the current and the previous year only.
C. Should be issued for all 3 years.
D. May be issued at the company’s option for any or all of the 3 years.

- Answer (A) is incorrect because A statement of cash flows must be provided for all 3 years.
- Answer (B) is incorrect because A statement of cash flows must be provided for all 3 years.
- Answer (C) is correct. When a business enterprise provides a set of financial statements that reports both financial position and results of operations, it must also present a statement of cash flows for each period for which the results of operations are provided.
- Answer (D) is incorrect because The statement of cash flows is not optional in these circumstances.
When classifying assets as current and noncurrent for reporting purposes,

A. The amounts at which current assets are carried and reported must reflect realizable cash values.
B. Prepayments for items such as insurance or rent are included in an “other assets” group rather than as current assets as they will ultimately be expensed.
C. The time period by which current assets are distinguished from noncurrent assets is determined by the seasonal nature of the business.
D. Assets are classified as current if they are reasonably expected to be realized in cash or consumed during the normal operating cycle.

- Answer (A) is incorrect because Current assets are measured using different attributes, for example, lower of cost or market for inventory and net realizable value for accounts receivable.
- Answer (B) is incorrect because Prepayments may qualify as current assets. They often will be consumed during the operating cycle.
- Answer (C) is incorrect because The classification criterion is based on the normal operating cycle regardless of the seasonality of the business.
- Answer (D) is correct. For financial reporting purposes, current assets consist of cash and other assets or resources expected to be realized in cash, sold, or consumed during the longer of 1 year or the normal operating cycle of the business.

A statement of financial position is intended to help investors and creditors

A. Assess the amount, timing, and uncertainty of prospective net cash inflows of a firm.
B. Evaluate economic resources and obligations of a firm.
C. Evaluate economic performance of a firm.
D. Evaluate changes in the ownership equity of a firm.

- Answer (A) is incorrect because Providing information to help assess the amount, timing, and uncertainty of cash flows is an objective of the statement of cash flows.
- Answer (B) is correct. The statement of financial position, or balance sheet, provides information about an entity’s resource structure (assets) and financing structure (liabilities and equity) at a moment in time. According to the FASB’s Conceptual Framework, the statement of financial position does not purport to show the value of a business, but it enables investors, creditors, and other users to make their own estimates of value. It helps users to assess liquidity, financial flexibility, profitability, and risk.
- Answer (C) is incorrect because The primary focus of financial reporting is information about an enterprise’s performance provided by measures of earnings and its components. Hence, an income statement is more directly useful to investors and creditors for evaluating economic performance.
- Answer (D) is incorrect because Disclosures of changes in shareholders’ equity, in either the basic statements, the notes thereto, or a separate statement, help users to evaluate changes in the ownership equity of a firm.

All other things being equal, which one of the following factors would result in an increase in cash reported on the balance sheet from one period to the next?

A. Reduction of the days’ sales outstanding in accounts receivable.
B. Decrease in the accrued vacation liability.
C. Increase in the level of inventory held.
D. Increase in the speed with which accounts payable invoices are paid.
Answer (A) is correct. A reduction of the days’ sales outstanding in accounts receivable signifies that the company is collecting accounts receivables at a faster pace, meaning an increase in the cash reported on the balance sheet on the next period.

Answer (B) is incorrect because a decrease in the accrued vacation liability signifies that liabilities are being paid, meaning a decrease in the cash reported on the balance sheet on the next period.

Answer (C) is incorrect because an increase in the level of inventory being held signifies more purchases in the next period, meaning either a decrease in cash (if the inventory was bought with cash) or an increase in liabilities (if the inventory was purchased on credit). Either way, this would not increase cash.

Answer (D) is incorrect because an increase in the speed with which accounts payable invoices are paid signifies a faster outflow of cash for payment of the liabilities, meaning a decrease in the cash reported on the balance sheet.

Each of the following statements about the balance sheet is true except

A. It is a picture of the firm’s financial position at a particular point in time.
B. It presents the firm’s assets and claims against those assets.
C. It helps users assess the firm’s liquidity.
D. It shows the sources and uses of cash.

- Answer (A) is incorrect because the balance sheet is a picture of the firm’s financial position at a particular point in time.
- Answer (B) is incorrect because the balance presents the firm’s assets and claims against those assets.
- Answer (C) is incorrect because the balance sheet helps users assess the firm’s liquidity.
- Answer (D) is correct. Sources and uses of cash are shown in the statement of cash flows.

An income statement for a business prepared under the current operating performance concept would include only the recurring earnings from its normal operations and

A. No other items.
B. Any extraordinary items.
C. Any prior-period adjustments.
D. Any gains or losses from extinguishment of debt.

- Answer (A) is correct. The current operating performance concept emphasizes the ordinary, normal, recurring operations of the entity during the current period. In this view, the inclusion of extraordinary items or prior-period adjustments is believed to impair the significance of net income. (The current operating performance concept is not recognized under U.S. GAAP.)
- Answer (B) is incorrect because extraordinary items are excluded under the current operating performance concept.
- Answer (C) is incorrect because prior-period adjustments are excluded under the current operating performance concept.
- Answer (D) is incorrect because gains and losses from extinguishment of debt are extraordinary.
The major distinction between the multiple-step and single-step income statement formats is the separation of

A. Operating and nonoperating data.
B. Income tax expense and administrative expenses.
C. Cost of goods sold expense and administrative expenses.
D. The effect on income taxes due to extraordinary items and the effect on income taxes due to income before extraordinary items.

- Answer (A) is correct. Within the income from continuing operations classification, the single-step income statement provides one grouping for revenue items and one for expense items. The single-step is the one subtraction necessary to arrive at income from continuing operations prior to the effect of income taxes. In contrast, the multiple-step income statement matches operating revenues and expenses separately from nonoperating items. This format emphasizes subtotals such as gross margin, operating income, and nonoperating income within presentation of income from continuing operations.
- Answer (B) is incorrect because the major distinction is the separation of operating and nonoperating data.
- Answer (C) is incorrect because the major distinction is the separation of operating and nonoperating data.
- Answer (D) is incorrect because the major distinction is the separation of operating and nonoperating data.

In a multiple-step income statement for a retail company, all of the following are included in the operating section except

A. Sales.
B. Cost of goods sold.
C. Dividend revenue.
D. Administrative and selling expenses.

- Answer (A) is incorrect because Sales is part of the normal operations of a retailer.
- Answer (B) is incorrect because Cost of goods sold is part of the normal operations of a retailer.
- Answer (C) is correct. The operating section of a retailer’s income statement includes all revenues and costs necessary for the operation of the retail establishment, e.g., sales, cost of goods sold, administrative expenses, and selling expenses. Dividend revenue, however, is classified under other revenues. In a statement of cash flows, cash dividends received are considered an operating cash flow.
- Answer (D) is incorrect because Administrative and selling expenses are part of the normal operations of a retailer.
In Hopkins Co.’s Year 3 single-step income statement, the section titled **Revenues** consisted of the following:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales revenue</td>
<td>$187,000</td>
</tr>
<tr>
<td>Results from discontinued operations:</td>
<td></td>
</tr>
<tr>
<td>Income from operations of component (including gain on disposal of $21,600)</td>
<td>$18,000</td>
</tr>
<tr>
<td>Income tax</td>
<td>(6,000)</td>
</tr>
<tr>
<td>Interest revenue</td>
<td>10,200</td>
</tr>
<tr>
<td>Gain on sale of equipment</td>
<td>4,700</td>
</tr>
<tr>
<td>Cumulative change in Year 1 and Year 2 income due to change in depreciation method (net of $750 tax effect)</td>
<td>1,500</td>
</tr>
<tr>
<td><strong>Total revenues</strong></td>
<td><strong>$215,400</strong></td>
</tr>
</tbody>
</table>

In the revenues section of the Year 3 income statement, Hopkins should have reported total revenues of

A. $217,800  
B. $215,400  
C. $203,700  
D. $201,900

- Answer (A) is incorrect because The amount of $217,800 equals $215,400 reported total revenues, plus the $2,400 loss from operations of the segment.
- Answer (B) is incorrect because The amount of $215,400 improperly includes the results from discontinued operations and the cumulative-effect type change.
- Answer (C) is incorrect because The amount of $203,700 improperly subtracts interest revenue and does not adjust for the results from discontinued operations.
- Answer (D) is correct. Revenue is a component of income from continuing operations. Results of discontinued operations is a classification in the income statement separate from continuing operations. The cumulative effect of a change in accounting principle is not reported in the income statement. Hence, total revenues were $201,900 ($215,400 – $12,000 results from discontinued operations – $1,500 cumulative-effect type change). Alternatively, total revenues consist of net sales of $187,000, plus interest revenue of $10,200, plus gain on sale of equipment (which is not an extraordinary item) of $4,700.

When reporting extraordinary items,

A. Each item (net of tax) is presented on the face of the income statement separately as a component of net income for the period.
B. Each item is presented exclusive of any related income tax.
C. Each item is presented as an unusual item within income from continuing operations.
D. All extraordinary gains or losses that occur in a period are summarized as total gains and total losses, then offset to present the net extraordinary gain or loss.

- Answer (A) is correct. Extraordinary items are reported net of tax after discontinued operations.
- Answer (B) is incorrect because Extraordinary items are to be reported net of the related tax effect.
- Answer (C) is incorrect because Extraordinary items are not reported in the continuing operations section of the income statement.
- Answer (D) is incorrect because Each extraordinary item is to be reported separately.
Which one of the following items is included in the determination of income from continuing operations?

A. Discontinued operations.
B. Extraordinary loss.
C. Cumulative effect of a change in an accounting principle.
D. Unusual loss from a write-down of inventory.

- Answer (A) is incorrect because Discontinued operations are reported separately from income from continuing operations.
- Answer (B) is incorrect because Extraordinary loss is reported separately from income from continuing operations.
- Answer (C) is incorrect because A cumulative effect of a change in an accounting principle is not reported in the income statement.
- Answer (D) is correct. Certain items ordinarily are not to be treated as extraordinary gains and losses. Rather, they are included in the determination of income from continuing operations. These gains and losses include those from write-downs of receivables and inventories, translation of foreign currency amounts, disposal of a business segment, sale of productive assets, strikes, and accruals on long-term contracts. A write-down of inventory is therefore included in the computation of income from continuing operations.

Brett Corporation had retained earnings of $529,000 at January 1 of the current year. Net income for the year was $2,496,000, and cash dividends of $750,000 were declared and paid. Another $50,000 of dividends were declared late in December, but were unpaid at year end. Brett’s ending balance of its statement of retained earnings is

A. $1,696,000
B. $2,225,000
C. $2,275,000
D. $3,025,000

- Answer (A) is incorrect because The amount of $1,696,000 does not include the beginning balance.
- Answer (B) is correct. Dividends declared but not paid reduce retained earnings. Thus, the year-end balance of retained earnings is calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1 balance</td>
<td>$529,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$2,496,000</td>
</tr>
<tr>
<td>Retained earnings available</td>
<td>$3,025,000</td>
</tr>
<tr>
<td>Dividends paid during year</td>
<td>$750,000</td>
</tr>
<tr>
<td>Dividends declared in Dec.</td>
<td>$50,000</td>
</tr>
<tr>
<td>Year-end declared in Dec.</td>
<td>$800,000</td>
</tr>
<tr>
<td>Year-end balance</td>
<td>$2,225,000</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because The amount of $2,275,000 results from a failure to deduct the dividend that was unpaid; such a dividend would be a liability of the corporation.
- Answer (D) is incorrect because The amount of $3,025,000 results from a failure to deduct dividends.
The changes in account balances of the Samson Corporation during the year are presented below:

<table>
<thead>
<tr>
<th>Increase</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets</td>
<td>$356,000</td>
</tr>
<tr>
<td>Liabilities</td>
<td>108,000</td>
</tr>
<tr>
<td>Capital stock</td>
<td>240,000</td>
</tr>
<tr>
<td>Additional paid-in-capital</td>
<td>24,000</td>
</tr>
</tbody>
</table>

Assuming there are no charges to retained earnings other than for a dividend payment of $52,000, the net income for the year should be

A. $16,000  
B. $36,000  
C. $52,000  
D. $68,000

- Answer (A) is incorrect because the amount of $16,000 is the excess of the sum of the increases in the capital accounts other than retained earnings over the increase in net assets.
- Answer (B) is correct. To calculate net income, the dividend payment ($52,000) should be added to the increase in assets ($356,000). The excess of this sum ($408,000) over the increase in liabilities ($108,000) gives the total increase in owners’ equity ($300,000). The excess of this amount over the combined increases in the capital accounts ($264,000) equals the increase in retained earnings ($36,000) arising from net income.
- Answer (C) is incorrect because the amount of $52,000 is the dividend.
- Answer (D) is incorrect because the amount of $68,000 equals the sum of the dividend and the excess of the sum of the increases in the capital accounts other than retained earnings over the increase in net assets.

When a business enterprise provides a full set of general-purpose financial statements reporting financial position, results of operations, and cash flows, comprehensive income and its components should

A. Appear as a part of discontinued operations, extraordinary items, and cumulative effect of a change in accounting principle.
B. Be reported net of related income tax effects, in total and individually.
C. Appear in a supplemental schedule in the notes to the financial statements.
D. Be displayed in a financial statement that has the same prominence as other financial statements.

- Answer (A) is incorrect because discontinued operations and extraordinary items are components of net income, which is itself a component of comprehensive income. The cumulative effect of a change in accounting principle is not reported in the income statement.
- Answer (B) is incorrect because the components of OCI are displayed either (1) net of related tax effects or (2) before the related tax effects with one amount shown for the aggregate tax effect related to the total of OCI. No amount is displayed for the tax effect related to total comprehensive income.
- Answer (C) is incorrect because comprehensive income and its components must be displayed in a financial statement given the same prominence as other financial statements included in the full set of financial statements.
- Answer (D) is correct. If an enterprise that reports a full set of financial statements has items of other comprehensive income (OCI), it must display comprehensive income and its components in a financial statement having the same prominence as the other statements included in the full set. No particular format is required, but net income must be displayed as a component of comprehensive income in that statement.
**Fact Pattern #2**

The Horatio Company’s beginning and ending inventories for the fiscal year ended September 30, Year 2, are

<table>
<thead>
<tr>
<th></th>
<th>Oct. 1, Year 1</th>
<th>Sept. 30, Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>$30,000</td>
<td>$44,000</td>
</tr>
<tr>
<td>Work-in-process (WIP)</td>
<td>80,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Finished goods</td>
<td>16,000</td>
<td>24,000</td>
</tr>
</tbody>
</table>

Production data for the fiscal Year ended September 30, Year 2, are

- Materials purchased: $160,000
- Purchase discounts taken: 2,000
- Direct labor: 200,000
- Manufacturing overhead: 150,000

**[50]** (Refers to Fact Pattern #2)

Horatio’s cost of goods manufactured (COGM) for the Year ended September 30, Year 2, is

A. $484,000  
B. $494,000  
C. $504,000  
D. $518,000

- Answer (A) is incorrect because this amount results from reversing the effect of the change in WIP.  
- Answer (B) is incorrect because this amount does not consider the change in WIP.  
- Answer (C) is correct. COGM equals all manufacturing costs incurred during the period, plus BWIP, minus EWIP. Materials used equals $144,000 ($30,000 BI + $160,000 purchased – $2,000 discounts – $44,000 EI). Thus, manufacturing costs incurred during the period equal $494,000 ($144,000 materials used + $200,000 DL + $150,000 OH), and COGM equals $504,000 ($494,000 + $80,000 BWIP – $70,000 EWIP).  
- Answer (D) is incorrect because this amount does not consider the change in materials inventory.

**[51]** (Refers to Fact Pattern #2)

Horatio’s cost of goods sold (COGS) for the year ended September 30, Year 2, is

A. $500,000  
B. $504,000  
C. $508,000  
D. $496,000

- Answer (A) is incorrect because this amount results from reversing the treatment of purchase discounts.  
- Answer (B) is incorrect because this amount is the COGM.  
- Answer (C) is incorrect because this amount results from assuming that no beginning or ending inventories of materials, WIP, or finished goods existed.  
- Answer (D) is correct. COGS equals COGM adjusted for the change in finished goods inventory. COGM equals all manufacturing costs incurred during the period, plus BWIP, minus EWIP. Materials used equals $144,000 ($30,000 BI + $160,000 purchased – $2,000 discounts – $44,000 EI). Thus, manufacturing costs incurred during the period equal $494,000 ($144,000 materials used + $200,000 DL + $150,000 OH), and COGM equals $504,000 ($494,000 + $80,000 BWIP – $70,000 EWIP). Accordingly, COGS is $496,000 ($504,000 COGM + $16,000 BFG – $24,000 EFG).
The total value of inventory to be reported on Horatio’s balance sheet at September 30, Year 2, is

A. $44,000  
B. $70,000
C. $24,000  
D. $138,000

- Answer (A) is incorrect because this amount is the ending materials inventory.
- Answer (B) is incorrect because this amount is the WIP.
- Answer (C) is incorrect because this amount is the finished goods inventory.
- Answer (D) is correct. The ending inventory consists of three elements: materials of $44,000, WIP of $70,000, and finished goods of $24,000, a total of $138,000.

Which of the following items should be reported as a component of other comprehensive income (OCI)?

A. Unrealized loss on an investment classified as a trading security.  
B. Unrealized loss on an investment classified as an available-for-sale security. 
C. Realized loss on an investment classified as an available-for-sale security.  
D. Cumulative effect of a change in accounting principle.

- Answer (A) is incorrect because unrealized gains and losses on trading securities are components of net income.
- Answer (B) is correct. Comprehensive income includes all changes in equity (net assets) of a business entity except those changes resulting from investments by owners and distributions to owners. Comprehensive income includes two major categories: net income and OCI. Net income includes the results of operations classified as income from continuing operations, discontinued operations, and extraordinary items. Components of comprehensive income not included in the determination of net income are included in OCI; for example, unrealized gains and losses on available-for-sale securities (except those that are hedged items in a fair value hedge).
- Answer (C) is incorrect because realized gains and losses on available-for-sale securities are components of net income.
- Answer (D) is incorrect because the cumulative effect of a change in accounting principle is not reported in the income statement.
[Fact Pattern #3]
A company’s pre-closing trial balance and other pertinent information at December 31 are as follows. The opening balance of inventory was $140,000. The long-term debt pays interest at a rate of 10% per annum, payable every 12 months. The debt was issued on July 1 of the current year and originally had 5 years to maturity. The fixed assets have a 10-year estimated useful life and were 1 year old at the start of the current year. Straight-line depreciation is used by the company.

<table>
<thead>
<tr>
<th>Dr.</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$80,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>100,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>230,000</td>
</tr>
<tr>
<td>Gross fixed assets</td>
<td>600,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>60,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>180,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Common stock</td>
<td>210,000</td>
</tr>
<tr>
<td>Retained earnings (Jan. 1)</td>
<td>500,000</td>
</tr>
<tr>
<td>Sales revenue</td>
<td>750,000</td>
</tr>
<tr>
<td>Purchases</td>
<td>530,000</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>200,000</td>
</tr>
</tbody>
</table>

[54] (Refers to Fact Pattern #3)
On the year-end financial statements, the company will report cost of goods sold of

A. $440,000
B. $530,000
C. $620,000
D. $670,000

- Answer (A) is correct. Cost of goods sold equals beginning inventory, plus purchases, minus ending inventory. Hence, cost of goods old is $440,000 ($140,000 + $530,000 – $230,000).
- Answer (B) is incorrect because Purchases equals $530,000.
- Answer (C) is incorrect because Reversing the opening and closing inventory figures results in $620,000.
- Answer (D) is incorrect because Omitting closing inventory from the calculation results in $670,000.

[55] Which one of the following would be shown on a multiple-step income statement but not on a single-step income statement?

A. Loss from discontinued operations.
B. Gross profit.
C. Extraordinary gain.
D. Net income from continuing operations.

- Answer (A) is incorrect because Loss from discontinued operations is shown on both a multiple-step and a single-step income statement.
- Answer (B) is correct. A single-step income statement combines all revenues and gains, combines all expenses and losses, and subtracts the latter from the former in a “single step” to arrive at net income. Gross profit, being the difference between sales revenue and cost of goods sold, does not appear on a single-step income statement.
Answer (C) is incorrect because Extraordinary gain is shown on both a multiple-step and a single-step income statement.
Answer (D) is incorrect because Net income from continuing operations is shown on both a multiple-step and a single-step income statement.

The major segments of the statement of retained earnings for a period are

A. Dividends declared, prior period adjustments, and changes due to treasury stock transactions.
B. Before-tax income or loss and dividends paid or declared.
C. Prior-period adjustments, before-tax income or loss, income tax, and dividends paid.
D. Net income or loss, prior-period adjustments, and dividends paid or declared.

Answer (A) is incorrect because it omits net income, the one item that always appears on the retained earnings statement.
Answer (B) is incorrect because after-tax income (loss) is included in the statement.
Answer (C) is incorrect because after-tax income (loss) is included in the statement.
Answer (D) is correct. The statement of retained earnings is a basic financial statement. Together with the income statement, the statement of retained earnings is meant to broadly reflect the results of operations. The statement of retained earnings consists of beginning retained earnings adjusted for any prior period adjustment (net of tax), with further adjustments for income (loss), dividends, and in certain other rare adjustments, e.g., quasi-reorganizations. The final figure is ending retained earnings.

Which one of the following is included in comprehensive income but excluded from net income?

A. Cumulative effects of a change in accounting principle.
B. Extraordinary gains and losses.
C. Unrealized holding gains and losses on available-for-sale securities.
D. Results of discontinued operations.

Answer (A) is incorrect because the cumulative effects of a change in accounting principle affect the balance sheet.
Answer (B) is incorrect because extraordinary gains and losses are presented in a separate caption of the income statement.
Answer (C) is correct. The three most common items of comprehensive income are holding gains and losses, such as changes in the fair values of available-for-sale securities; adjustments arising from translating an entity’s financial statements from its functional currency into the reporting currency; and the portion of unrecognized prior service cost that was not recognized in pension expense.
Answer (D) is incorrect because results of discontinued operations are presented in a separate caption of the income statement.

Because of inexact estimates of the service life and the residual value of a plant asset, a fully depreciated asset was sold at a material gain. This gain should be reported

A. In the other revenues and gains section of the income statement.
B. As part of sales revenue on the income statement.
C. In the extraordinary item section of the income statement.
D. As an adjustment to prior periods’ depreciation on the statement of retained earnings.
Answer (A) is correct. Gains are increases in equity from peripheral or incidental transactions. Thus, the gain on the sale of an asset is not an operating item and should be classified in a multiple-step income statement in the other revenues and gains section.

Answer (B) is incorrect because The asset sold was not stock in trade and the sale of plant assets does not constitute the entity’s major or central operations, so the proceeds should not be classified as sales revenue.

Answer (C) is incorrect because The transaction does not meet the criteria of an extraordinary item (unusual in nature and infrequent in occurrence in the environment in which the entity operates).

Answer (D) is incorrect because The transaction is not a prior-period adjustment. It is not the correction of an error in the financial statements of a prior period.

When preparing the statement of cash flows, companies are required to report separately as operating cash flows all of the following except

A. Interest received on investments in bonds.
B. Interest paid on the company’s bonds.
C. Cash collected from customers.
D. Cash dividends paid on the company’s stock.

- Answer (A) is incorrect because Interest received from investments is an operating cash flow.
- Answer (B) is incorrect because Interest paid on bonds is an operating cash flow.
- Answer (C) is incorrect because Customer collections is an operating cash flow.
- Answer (D) is correct. In general, the cash flows from transactions and other events that enter into the determination of income are to be classified as operating. Cash receipts from sales of goods and services, from interest on loans, and from dividends on equity securities are from operating activities. Cash payments to suppliers for inventory; to employees for wages; to other suppliers and employees for other goods and services; to governments for taxes, duties, fines, and fees; and to lenders for interest are also from operating activities. However, distributions to owners (cash dividends on a company’s own stock) are cash flows from financing, not operating, activities.

A statement of cash flows is intended to help users of financial statements

A. Evaluate a firm’s liquidity, solvency, and financial flexibility.
B. Evaluate a firm’s economic resources and obligations.
C. Determine a firm’s components of income from operations.
D. Determine whether insiders have sold or purchased the firm’s stock.

- Answer (A) is correct. The primary purpose of a statement of cash flows is to provide information about the cash receipts and payments of an entity during a period. If used with information in the other financial statements, the statement of cash flows should help users to assess the entity’s ability to generate positive future net cash flows (liquidity), its ability to meet obligations (solvency) and pay dividends, the need for external financing, the reasons for differences between income and cash receipts and payments, and the cash and noncash aspects of the investing and financing activities.
- Answer (B) is incorrect because The statement of cash flows deals with only one resource: cash.
- Answer (C) is incorrect because The income statement shows the components of income from operations.
- Answer (D) is incorrect because The identity of stock buyers and sellers is not shown.
A financial statement includes all of the following items: net income, depreciation, operating activities, and financing activities. What financial statement is this?

A. Balance sheet.
B. Income statement.
C. Statement of cash flows.
D. Statement of changes in equity.

- Answer (A) is incorrect because The balance sheet does not include periodic net income or depreciation expense.
- Answer (B) is incorrect because The income statement does not have captions for operating and financing activities.
- Answer (C) is correct. A statement of cash flows is a required financial statement. Its primary purpose is to provide information about cash receipts and payments by reporting the cash effects of an enterprise’s operating, investing, and financing activities. Related disclosures report the effects of noncash investing and financing activities. Because the statement or a separate schedule reconciles net income and net operating cash flow, depreciation, a noncash expense, is included in the presentation.
- Answer (D) is incorrect because Equity does not include captions for operating and investing activities, depreciation, and net income.

Which of the following items is specifically included in the body of a statement of cash flows?

A. Operating and nonoperating cash flow information.
B. Conversion of debt to equity.
C. Acquiring an asset through a capital lease.
D. Purchasing a building by giving a mortgage to the seller.

- Answer (A) is correct. All noncash transactions are excluded from the body of the statement of cash flows to avoid undue complexity and detraction from the objective of providing information about cash flows. Information about all noncash financing and investing activities affecting recognized assets and liabilities shall be reported in related disclosures.
- Answer (B) is incorrect because Noncash transactions are excluded from the body of the statement of cash flows.
- Answer (C) is incorrect because Noncash transactions are excluded from the body of the statement of cash flows.
- Answer (D) is incorrect because Noncash transactions are excluded from the body of the statement of cash flows.

Select the combination below that explains the impact of credit card interest incurred and paid during the period on (1) equity on the balance sheet and (2) the statement of cash flows.

<table>
<thead>
<tr>
<th>(1) Effect of Equity on Balance Sheet</th>
<th>(2) Reflected on Statement of Cash Flows as a(n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Decrease</td>
<td>Financing outflow</td>
</tr>
<tr>
<td>B. Decrease</td>
<td>Operating outflow</td>
</tr>
<tr>
<td>C. No effect</td>
<td>Financing outflow</td>
</tr>
<tr>
<td>D. No effect</td>
<td>Operating outflow</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because The cash flow would be considered as operating, not financing.
Answer (B) is correct. Credit card interest incurred is classified as interest expense on the income statement, which in turn reduces equity on the balance sheet by reducing retained earnings. Cash payments to lenders and other creditors for interest, e.g., credit card interest payments, are to be classified on the statement of cash flows as an outflow of cash from operating activities.

Answer (C) is incorrect because the cash flow would be considered as operating, not financing.

Answer (D) is incorrect because the payment of interest is an expense that will decrease retained earnings on the balance sheet.

In the statement of cash flows, the payment of common share dividends appears in the <List A> activities section as a <List B> of cash.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Operating</td>
</tr>
<tr>
<td>B.</td>
<td>Financing</td>
</tr>
<tr>
<td>C.</td>
<td>Investing</td>
</tr>
<tr>
<td>D.</td>
<td>Investing</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because the payment would be in the financing, not operating, section.
- Answer (B) is correct. Financing activities include, among other things, obtaining resources from owners and providing them with a return on, and a return of, their investment. Consequently, the payment of cash dividends to providers of common equity financing is a use of cash that appears in the financing section of the statement of cash flows.
- Answer (C) is incorrect because dividends appear in the financing, not investing, section.
- Answer (D) is incorrect because dividends appear in the financing, not investing, section.

With respect to the content and form of the statement of cash flows, the

A. Pronouncements covering the cash flow statement encourage the use of the indirect method.
B. Indirect method adjusts ending retained earnings to reconcile it to net cash flows from operations.
C. Direct method of reporting cash flows from operating activities includes disclosing the major classes of gross cash receipts and gross cash payments.
D. Reconciliation of the net income to net operating cash flow need not be presented when using the direct method.

- Answer (A) is incorrect because the FASB encourages use of the direct method.
- Answer (B) is incorrect because the indirect method reconciles net income with the net cash flow from operations.
- Answer (C) is correct. The FASB encourages use of the direct method of reporting major classes of operating cash receipts and payments, but the indirect method may be used. The minimum disclosures of operating cash flows under the direct method are cash collected from customers, interest and dividends received, other operating cash receipts, cash paid to employees and other suppliers of goods or services, interest paid, income taxes paid, and other operating cash payments.
- Answer (D) is incorrect because the reconciliation is required regardless of the method used.
The statement of cash flows may be presented in either a direct or an indirect (reconciliation) format. In which of these formats would cash collected from customers be presented as a gross amount?

<table>
<thead>
<tr>
<th>Direct</th>
<th>Indirect</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td>No</td>
</tr>
<tr>
<td>B. No</td>
<td>Yes</td>
</tr>
<tr>
<td>C. Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>D. Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Only the direct method format for the statement of cash flows presents cash collected from customers as a gross amount.
- Answer (B) is incorrect because Only the direct method format for the statement of cash flows presents cash collected from customers as a gross amount.
- Answer (C) is incorrect because Only the direct method format for the statement of cash flows presents cash collected from customers as a gross amount.
- Answer (D) is correct. The statement of cash flows may report cash flows from operating activities in either an indirect (reconciliation) or a direct format. The direct format reports the major classes of operating cash receipts and cash payments as gross amounts. The indirect presentation reconciles net income to the same amount of net cash flow from operations that would be determined in accordance with the direct method. To arrive at net operating cash flow, the indirect method adjusts net income by removing the effects of (1) all deferrals of past operating cash receipts and payments, (2) all accruals of expected future operating cash receipts and payments, (3) all financing and investing activities, and (4) all noncash operating transactions.

Depreciation expense is added to net income under the indirect method of preparing a statement of cash flows in order to

- Answer (A) is incorrect because Assets other than cash are not shown on the statement of cash flows.
- Answer (B) is incorrect because Depreciation is recorded on the income statement. On the statement of cash flows, depreciation is added back to net income because it was previously deducted on the income statement.
- Answer (C) is correct. The indirect method begins with net income and then removes the effects of past deferrals of operating cash receipts and payments, accruals of expected future operating cash receipts and payments, and net income items not affecting operating cash flows (e.g., depreciation).
- Answer (D) is incorrect because Net carrying amount of assets is reported on the balance sheet, not the statement of cash flows.
In reconciling net income on an accrual basis to net cash provided by operating activities, what adjustment is needed to net income because of (1) an increase during the period in prepaid expenses and (2) the periodic amortization of premium on bonds payable?

<table>
<thead>
<tr>
<th>(1) Increase in Prepaid Expenses</th>
<th>(2) Amortization of Premium on Bonds Payable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Add</td>
<td>Add</td>
</tr>
<tr>
<td>B. Add</td>
<td>Deduct</td>
</tr>
<tr>
<td>C. Deduct</td>
<td>Add</td>
</tr>
<tr>
<td>D. Deduct</td>
<td>Deduct</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because an increase in prepaid expenses would need to be deducted from net income to get cash flow from operations.
- Answer (B) is incorrect because an increase in prepaid expenses would need to be deducted from net income to get cash flow from operations.
- Answer (C) is incorrect because amortization of bond premium would be deducted from net income.
- Answer (D) is correct. An increase in prepaid expenses indicates that cash outlays for expenses exceeded the related expense incurred; thus, net income exceeded net cash provided by operations and a deduction is needed in the reconciliation. Also, the amortization of premium on bonds payable causes a reduction of interest expense but does not increase cash; therefore, net income exceeds net cash from operating activities, and a deduction is needed in the reconciliation.

In the statement of cash flows, a reconciliation of net cash flows from operating activities to net income

A. Must be reported in the statement of cash flows.
B. Must be presented separately in a related disclosure.
C. May be either reported in the statement of cash flows or presented separately in a related disclosure.
D. Need not be presented.

- Answer (A) is incorrect because the reconciliation may be presented in a related disclosure.
- Answer (B) is incorrect because the reconciliation may be reported in the statement of cash flows.
- Answer (C) is correct. The reporting entity must present a reconciliation of net income to net operating cash flow. This reconciliation removes the effects of (1) all deferrals of past operating cash flows, (2) all accruals of estimated future operating cash flows, and (3) items whose cash effects are investing or financing cash flows. This reconciliation may be either (1) reported in the statement of cash flows or (2) provided separately in a related schedule, with the statement of cash flows presenting only the net cash flows from operating activities.
- Answer (D) is incorrect because a reconciliation must be reported in an indirect presentation of the statement of cash flows.

All of the following should be classified under the operating section in a statement of cash flows except a

A. Decrease in inventory.
B. Depreciation expense.
C. Decrease in prepaid insurance.
D. Purchase of land and building in exchange for a long-term note.

- Answer (A) is incorrect because a decrease in inventory is an operating item.
Answer (B) is incorrect because Depreciation expense is an operating item.
Answer (C) is incorrect because A decrease in prepaid insurance is an operating item.
Answer (D) is correct. Operating activities include all transactions and other events not classified as investing and financing activities. Operating activities include producing and delivering goods and providing services. Cash flows from such activities are usually included in the determination of net income. However, the purchase of land and a building in exchange for a long-term note is an investing activity. Because this transaction does not affect cash, it is reported in related disclosures of noncash investing and financing activities.

Which one of the following transactions should be classified as a financing activity in a statement of cash flows?

A. Purchase of equipment.
B. Purchase of treasury stock.
C. Sale of trademarks.
D. Payment of interest on a mortgage note.

Answer (A) is incorrect because The purchase of equipment is an investing activity.
Answer (B) is correct. Financing activities are defined to include the issuance of stock, the payment of dividends, the receipt of donor-restricted resources to be used for long-term purposes, treasury stock transactions (purchases or sales), the issuance of debt, the repayment of amounts borrowed, obtaining and paying for other resources obtained from creditors on long-term credit.
Answer (C) is incorrect because The sale of trademarks, like the sale of any long-lived asset, is an investing activity.
Answer (D) is incorrect because The payment of interest on a mortgage note is an operating activity.

When using the indirect method to prepare a statement of cash flows, which one of the following should be deducted from net income when determining net cash flows from operating activities?

A. An increase in accrued liabilities.
B. Amortization of premiums on bonds payable.
C. A loss on the sale of plant assets.
D. Depreciation expense.

Answer (A) is incorrect because An increase in accrued liabilities reflects an increase in noncash expenses and is added to net income.
Answer (B) is correct. The indirect method reconciles the net income of a business with the net operating cash flow. The indirect method removes the effects of all past deferrals of operating cash receipts and payments, all accruals of expected future operating cash receipts and payments, and all items not affecting operating cash flows to arrive at the net cash flow from operating activities. Hence, the amortization of the premium on bonds payable is deducted from net income in the reconciliation because it represents a noncash decrease in interest expense (an increase in net income).
Answer (C) is incorrect because A loss on the sale of plant assets is from an investing activity. Thus, it should be added to net income to determine net operating cash flow.
Answer (D) is incorrect because Depreciation is a noncash expense that should be added to net income.
Which one of the following transactions should **not** be classified as a financing activity in the statement of cash flows?

A. Issuance of common stock.
B. Purchase of treasury stock.
C. Payment of dividends.
D. Income tax refund.

- Answer (A) is incorrect because Issuance of common stock is classified as a financing activity.
- Answer (B) is incorrect because Purchase of treasury stock is classified as a financing activity.
- Answer (C) is incorrect because Payment of dividends is classified as a financing activity.
- **Answer (D) is correct.** Financing activities include obtaining resources from owners and providing them with a return on, and a return of, their investment. Cash inflows from financing activities include proceeds from issuing equity instruments. Cash outflows include outlays to reacquire the enterprise’s equity instruments, and outlays to pay dividends. However, an income tax refund is an operating activity.

All of the following should be classified as investing activities in the statement of cash flows **except**

A. Cash outflows to purchase manufacturing equipment.
B. Cash inflows from the sale of bonds of other entities.
C. Cash outflows to lenders for interest.
D. Cash inflows from the sale of a manufacturing plant.

- Answer (A) is incorrect because The purchase of equipment is an investing activity.
- Answer (B) is incorrect because The sale of bonds issued by another entity is an investing activity.
- **Answer (C) is correct.** Investing activities include the lending of money and the collecting of those loans; the acquisition, sale, or other disposal of debt or equity instruments; and the acquisition, sale, or other disposition of assets (excluding inventory) that are held for or used in the production of goods or services. Investing activities do not include acquiring and disposing of certain loans or other debt or equity instruments that are acquired specifically for resale. Cash outflows to lenders for interest are cash from an operating, not an investing, activity.
- Answer (D) is incorrect because The sale of a plant is an investing activity.

A reader of a statement of cash flows wishes to analyze the major classes of cash receipts and cash payments from operating activities. Which methods of reporting cash flows from operating activities will supply that information?

A. Both the direct and indirect methods.
B. Only the direct method.
C. Only the indirect method.
D. Neither method.

- Answer (A) is incorrect because Only the direct method supplies information about individual classes of gross cash receipts and payments related to operating activities.
Answer (B) is correct. The statement of cash flows may report cash flows from operating activities in either an indirect (reconciliation) or a direct format. The direct format reports the major classes of operating cash receipts and cash payments as gross amounts. The indirect presentation reconciles net income to the same amount of net cash flow from operations that would be determined in accordance with the direct method. To arrive at net operating cash flow, the indirect method adjusts net income by removing the effects of (1) all deferrals of past operating cash receipts and payments, (2) all accruals of expected future operating cash receipts and payments, (3) all financing and investing activities, and (4) all noncash operating transactions.

Answer (C) is incorrect because the direct method, rather than the indirect method, supplies information about individual classes of gross cash receipts and payments related to operating activities.

Answer (D) is incorrect because the direct method reports major classes of gross cash receipts and payments from operating activities.

[76] In a statement of cash flows (indirect method), depreciation expense should be presented as

A. An inflow of cash.
B. An outflow of cash.
C. An addition to net income in converting net income to net cash flows from operating activities.
D. A deduction from net income in converting net income to net cash flows from operating activities.

- Answer (A) is incorrect because depreciation does not involve an inflow or outflow of cash. The purchase and the sale of property, plant, and equipment constitute investing activities, but the process of depreciating such assets is not defined as an investing activity. Depreciation is a noncash operating expense.
- Answer (B) is incorrect because depreciation is a noncash operating expense.
- Answer (C) is correct. Because depreciation is a noncash charge to income, it is added to accrual-basis net income in the determination of cash flows from operating activities under the indirect method.
- Answer (D) is incorrect because depreciation should be added.

[77] All of the following should be included in the reconciliation of net income to net operating cash flow in the statement of cash flows except a(n)

A. Decrease in inventory.
B. Decrease in prepaid insurance.
C. Purchase of land and building in exchange for a long-term note.
D. Increase in income tax payable.

- Answer (A) is incorrect because a decrease in inventory is a reconciling item. It indicates that cost of goods sold exceeded purchases. Purchases is then adjusted for the change in accounts payable to determine cash paid to suppliers.
- Answer (B) is incorrect because a decrease in prepaid insurance is a reconciling item. It implies that insurance expense was greater than cash paid to insurers.
- Answer (C) is correct. The purchase of land and a building in exchange for a long-term note is a noncash investing activity that does not affect net income. Thus, it is reported in the related disclosures section of the cash flow statement but is not a reconciling item.
- Answer (D) is incorrect because an increase in income tax payable is a reconciling item. It means that income tax expense exceeded cash paid for income taxes.
In preparing a statement of cash flows, an item included in determining net cash flow from operating activities is the

A. Amortization of a bond premium.
B. Proceeds from the sale of equipment for cash.
C. Cash dividends paid.
D. Purchase of treasury stock.

- Answer (A) is correct. The debtor (issuer) on a bond sold at a premium debits or reduces the bond premium for the excess of cash interest paid over interest expense recognized under the effective interest method. The lender (buyer) likewise reduces the bond premium (by a credit) for the excess of cash interest received over interest income recognized. Interest paid (received) is a cash outflow (inflow) from an operating activity. In a reconciliation of net income to net cash flow from operating activities, both the issuer of the bond and the purchaser must make an adjustment for the difference between the cash flow and the effect on net income. Because the issuer’s cash outflow exceeded interest expense, it must deduct the difference (premium amortization) from net income in performing the reconciliation. The purchaser’s cash inflow is greater than interest income, so it must add the difference (premium amortization) to net income to arrive at net cash flow from operating activities.
- Answer (B) is incorrect because The sale of equipment is an investing activity, not an operating activity.
- Answer (C) is incorrect because A cash dividend paid is a cash outflow from a financing activity.
- Answer (D) is incorrect because The purchase of treasury stock is a financing activity since it involves a change in the amount of capital stock outstanding.

The information reported in the statement of cash flows should help investors, creditors, and others to assess all of the following except the

A. Amount, timing, and uncertainty of prospective net cash inflows of a firm.
B. Company’s ability to pay dividends and meet obligations.
C. Company’s ability to generate future cash flows.
D. Management of the firm with respect to the efficient and profitable use of its resources.

- Answer (A) is incorrect because The primary purpose of a statement of cash flows is to provide information about the cash receipts and payments of an entity during a period. A secondary purpose is to provide information about investing and financing activities. The statement should help users to assess the entity’s ability to generate positive future net cash flows, the ability to meet its obligations and pay dividends, the need for external financing, the reasons for differences between income and associated cash receipts and payments, and the cash and noncash aspects of the entity’s investing and financing activities.
- Answer (B) is incorrect because The primary purpose of a statement of cash flows is to provide information about the cash receipts and payments of an entity during a period. A secondary purpose is to provide information about investing and financing activities. The statement should help users to assess the entity’s ability to generate positive future net cash flows, the ability to meet its obligations and pay dividends, the need for external financing, the reasons for differences between income and associated cash receipts and payments, and the cash and noncash aspects of the entity’s investing and financing activities.
- Answer (C) is incorrect because The primary purpose of a statement of cash flows is to provide information about the cash receipts and payments of an entity during a period. A secondary purpose is to provide information about investing and financing activities. The statement should help users to assess the entity’s ability to generate positive future net cash flows, the ability to meet its obligations and pay dividends, the need for external financing, the reasons for differences between income and associated cash receipts and payments, and the cash and noncash aspects of the entity’s investing and financing activities.
Answer (D) is correct. The statement of cash flows is not designed to provide information with respect to the efficient and profitable use of the firm’s resources. Financial reporting provides information about an enterprise’s performance during a period when it was under the direction of a particular management but does not directly provide information about that management’s performance. Financial reporting does not try to separate the impact of a particular management’s performance from the effects of prior management actions, general economic conditions, the supply and demand for an enterprise’s inputs and outputs, price changes, and other events.

To calculate cash flows using the indirect method, which one of the following items must be added back to net income?

A. Revenue.
B. Marketing expense.
C. Depreciation expense.
D. Interest income.

- Answer (A) is incorrect because Revenues are not added back to net income when using the indirect method of cash flows. Revenues affect cash flows.
- Answer (B) is incorrect because Marketing expenses are not added back to net income when using the indirect method of cash flows. Marketing expenses affect cash flows.
- Answer (C) is correct. The indirect method begins with accrual-basis net income or the change in net assets and removes items that did not affect operating cash flow. Depreciation is a non-cash item and thus does not affect the cash flows. This amount must be added back to net income because it decreased net income even though it had no cash effect.
- Answer (D) is incorrect because Interest income is not added back to net income when using the indirect method of cash flows. Interest income affects cash flows.

The net income for Cypress, Inc., was $3,000,000 for the year ended December 31. Additional information is as follows:

- Depreciation on fixed assets $1,500,000
- Gain from cash sale of land 200,000
- Increase in accounts payable 300,000
- Dividends paid on preferred stock 400,000

The net cash provided by operating activities in the statement of cash flows for the year ended December 31 should be

A. $4,200,000
B. $4,500,000
C. $4,600,000
D. $4,800,000

- Answer (A) is incorrect because This amount equals net cash provided by operating activities minus the $400,000 financing activity.
- Answer (B) is incorrect because This amount equals net income, plus depreciation.
- Answer (C) is correct. Net operating cash flow may be determined by adjusting net income. Depreciation is an expense not directly affecting cash flows that should be added back to net income. The increase in accounts payable is added to net income because it indicates that an expense has been recorded but not paid. The gain on the sale of land is an accrual-basis item affecting net income and thus should be subtracted. The dividends paid on preferred stock are cash outflows from financing, not operating, activities and do not require an adjustment. Thus, net cash flow from operations is $4,600,000 ($3,000,000 + $1,500,000 – $200,000 + $300,000).
- Answer (D) is incorrect because This amount equals net income, plus depreciation, plus the increase in accounts payable.
Frazier Company reported current net income of $161,000. During the year, accounts receivable increased by $14,000 and accounts payable increased by $10,500. Inventories declined by $8,000. Depreciation expense was $40,000. Net cash provided by operating activities is

A. $165,000  
B. $189,500  
C. $205,500  
D. $212,500

- Answer (A) is incorrect because the amount of $165,000 results from a failure to add back depreciation—a noncash expense.  
- Answer (B) is incorrect because the amount of $189,500 results from deducting the inventory change rather than adding it.  
- Answer (C) is correct. The net income of $161,000 must be adjusted by noncash expenses (such as depreciation) and the amount of changes in current assets as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income</td>
<td>$161,000</td>
</tr>
<tr>
<td>Depreciation expense</td>
<td>$40,000</td>
</tr>
<tr>
<td>Increase in receivables</td>
<td>(14,000)</td>
</tr>
<tr>
<td>Increase in payables</td>
<td>$10,500</td>
</tr>
<tr>
<td>Decrease in inventories</td>
<td>$8,000</td>
</tr>
<tr>
<td>Net cash provided</td>
<td>$205,500</td>
</tr>
</tbody>
</table>

- Answer (D) is incorrect because the amount of $212,500 results from reversing the treatment of receivables and payables.

[Fact Pattern #4]

Royce Company had the following transactions during the fiscal year ended December 31, Year 2:

- Accounts receivable decreased from $115,000 on December 31, Year 1, to $100,000 on December 31, Year 2.  
- Royce’s board of directors declared dividends on December 31, Year 2, of $0.05 per share on the 2.8 million shares outstanding, payable to shareholders of record on January 31, Year 3. The company did not declare or pay dividends for fiscal Year 1.  
- Sold a truck with a net carrying amount of $7,000 for $5,000 cash, reporting a loss of $2,000.  
- Paid interest to bondholders of $780,000.  
- The cash balance was $106,000 on December 31, Year 1, and $284,000 on December 31, Year 2.

[83] (Refers to Fact Pattern #4)

Royce Company uses the direct method to prepare its statement of cash flows at December 31, Year 2. The interest paid to bondholders is reported in the

A. Financing section, as a use or outflow of cash.  
B. Operating section, as a use or outflow of cash.  
C. Investing section, as a use or outflow of cash.  
D. Debt section, as a use or outflow of cash.
Answer (A) is incorrect because Interest paid on bonds is an operating cash flow.

Answer (B) is correct. Payment of interest on debt is considered a cash outflow from an operating activity, although repayment of debt principal is a financing activity.

Answer (C) is incorrect because Investing activities include the lending of money and the acquisition, sale, or other disposal of securities that are not cash equivalents and the acquisition, sale, or other disposal of long-lived productive assets.

Answer (D) is incorrect because The statement of cash flows does not contain a debt section.

Royce Company uses the indirect method to prepare its Year 2 statement of cash flows. It reports a(n)

- Source or inflow of funds of $5,000 from the sale of the truck in the financing section.
- Use or outflow of funds of $140,000 in the financing section, representing dividends.
- Deduction of $15,000 in the operating section, representing the decrease in year-end accounts receivable.
- Addition of $2,000 in the operating section for the $2,000 loss on the sale of the truck.

Answer (A) is incorrect because The $5,000 inflow should be shown in the investing section.

Answer (B) is incorrect because No outflow of cash dividends occurred in Year 2.

Answer (C) is incorrect because The decrease in receivables should be added to net income.

Answer (D) is correct. The indirect method determines net operating cash flow by adjusting net income. Under the indirect method, the $5,000 cash inflow from the sale of the truck is shown in the investing section. A $2,000 loss was recognized and properly deducted to determine net income. This loss, however, did not require the use of cash and should be added to net income in the operating section.

The total of cash provided (used) by operating activities plus cash provided (used) by investing activities plus cash provided (used) by financing activities is

- Cash provided of $284,000.
- Cash provided of $178,000.
- Equal to net income reported for fiscal year ended December 31, Year 2.
- Answer (A) is incorrect because This amount is the ending cash balance, not the change in the cash balance; it ignores the beginning balance.

Answer (B) is correct. The total of cash provided (used) by the three activities (operating, investing, and financing) should equal the increase or decrease in cash for the year. During Year 2, the cash balance increased from $106,000 to $284,000. Thus, the sources of cash must have exceeded the uses by $178,000.

Answer (C) is incorrect because The cash balance increased during the year.

Answer (D) is incorrect because Net income must be adjusted for noncash expenses and other accruals and deferrals.
The following information was taken from the accounting records of Oak Corporation for the year ended December 31:

- Proceeds from issuance of preferred stock: $4,000,000
- Dividends paid on preferred stock: 400,000
- Bonds payable converted to common stock: 2,000,000
- Payment for purchase of machinery: 500,000
- Proceeds from sale of plant building: 1,200,000
- 2% stock dividend on common stock: 300,000
- Gain on sale of plant building: 200,000

The net cash flows from investing and financing activities that should be presented on Oak’s statement of cash flows for the year ended December 31 are, respectively,

A. $700,000 and $3,600,000.
B. $700,000 and $3,900,000.
C. $900,000 and $3,900,000.
D. $900,000 and $3,600,000.

- **Answer (A) is correct.** The relevant calculations are as follows:
  
<table>
<thead>
<tr>
<th>Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proceeds from sale of plant building</td>
<td>1,200,000</td>
</tr>
<tr>
<td>Payment for purchase of machinery</td>
<td>(500,000)</td>
</tr>
<tr>
<td>Net cash provided by investing activities</td>
<td>700,000</td>
</tr>
<tr>
<td>Proceeds from issuance of preferred stock</td>
<td>4,000,000</td>
</tr>
<tr>
<td>Dividends paid on preferred stock</td>
<td>(400,000)</td>
</tr>
<tr>
<td>Net cash provided by financing activities</td>
<td>3,600,000</td>
</tr>
</tbody>
</table>

- **Answer (B) is incorrect because** the stock dividend has no effect on cash flows from financing activities.
- **Answer (C) is incorrect because** the gain on the sale of the building is double counted in determining the net cash flow from investing activities.
- **Answer (D) is incorrect because** the gain on the sale of the building is double counted in determining the net cash flow from investing activities.

---

**Fact Pattern #5**

Heniser Corporation engaged in the following cash transactions during the current year:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale of land and building</td>
<td>280,000</td>
</tr>
<tr>
<td>Purchase of treasury stock</td>
<td>140,000</td>
</tr>
<tr>
<td>Purchase of land</td>
<td>137,000</td>
</tr>
<tr>
<td>Payment of cash dividend</td>
<td>185,000</td>
</tr>
<tr>
<td>Purchase of equipment</td>
<td>153,000</td>
</tr>
<tr>
<td>Issuance of common stock</td>
<td>247,000</td>
</tr>
<tr>
<td>Retirement of bonds</td>
<td>200,000</td>
</tr>
</tbody>
</table>
Heniser’s net cash provided (used) by investing activities is

A. $280,000
B. $(10,000)
C. $(210,000)
D. $(350,000)

- Answer (A) is incorrect because Failing to deduct the uses of cash results in $280,000.
- Answer (B) is correct. Investing activities include making and collecting loans and acquiring and disposing of debt or equity instruments; property, plant, and equipment; and other productive assets. The calculation is

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale of land and building</td>
<td>$280,000</td>
</tr>
<tr>
<td>Purchase of land</td>
<td>(137,000)</td>
</tr>
<tr>
<td>Purchase of equipment</td>
<td>(153,000)</td>
</tr>
<tr>
<td>Net cash used</td>
<td>$(10,000)</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because Deducting the retirement of bonds results in $(210,000).
- Answer (D) is incorrect because The amount of $(350,000) results from deducting the purchase of treasury stock, which would be a financing activity, not an investing activity.

Heniser’s net cash provided (used) by financing activities is

A. $247,000
B. $(78,000)
C. $(138,000)
D. $(278,000)

- Answer (A) is incorrect because Failing to deduct the uses of cash results in $247,000.
- Answer (B) is incorrect because Failing to deduct the retirement of bonds results in $(78,000).
- Answer (C) is incorrect because Failing to deduct for the purchase of treasury stock results in $(138,000).
- Answer (D) is correct. Financing activities include the issuance of stock, the payment of dividends, treasury stock transactions, and the issuance and repayment of debt. They also include receiving restricted resources that are donor-stipulated for long-term purposes. The calculation is

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issuance of common stock</td>
<td>$247,000</td>
</tr>
<tr>
<td>Purchase of treasury stock</td>
<td>(140,000)</td>
</tr>
<tr>
<td>Payment of cash dividend</td>
<td>(185,000)</td>
</tr>
<tr>
<td>Retirement of bonds</td>
<td>(200,000)</td>
</tr>
<tr>
<td>Net cash used</td>
<td>$(278,000)</td>
</tr>
</tbody>
</table>
Heniser’s net cash flow, assuming that it reported net cash provided by operating activities of $400,000, is

A. $112,000
B. $252,000
C. $392,000
D. $688,000

Answer (A) is correct. A statement of cash flows reports cash flows from operating activities, investing activities, and financing activities. Combining the $400,000 of cash provided by operating activities with the $10,000 use for investing activities and $278,000 use for financing activities results in a net source of cash of $112,000 ($400,000 – $10,000 – $278,000).

Answer (B) is incorrect because Failing to deduct the purchase of treasury stock results in $252,000.

Answer (C) is incorrect because Adding rather than deducting the treasury stock purchase results in $392,000.

Answer (D) is incorrect because Adding the uses of cash rather than deducting them results in $688,000.

In its statement of cash flows issued for the year ending June 30, Prince Company reported a net cash inflow from operating activities of $123,000. The following adjustments were included in the supplementary schedule reconciling cash flow from operating activities with net income:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation</td>
<td>$38,000</td>
</tr>
<tr>
<td>Increase in net accounts receivable</td>
<td>31,000</td>
</tr>
<tr>
<td>Decrease in inventory</td>
<td>27,000</td>
</tr>
<tr>
<td>Increase in accounts payable</td>
<td>48,000</td>
</tr>
<tr>
<td>Increase in interest payable</td>
<td>12,000</td>
</tr>
</tbody>
</table>

Net income is

A. $29,000
B. $41,000
C. $79,000
D. $217,000

Answer (A) is correct. To derive net income from net cash inflow from operating activities, various adjustments are necessary. The depreciation of $38,000 should be subtracted because it is a noncash item included in the determination of net income. The increase in net accounts receivable of $31,000 should be added because it signifies that sales revenue was greater than the cash collections from customers. The increase in accounts payable should be subtracted because it indicates that purchases were $48,000 greater than cash disbursements to suppliers. The second step of the transformation from cash paid to suppliers to cost of goods sold is to subtract the decrease in inventory. This change means that cost of goods sold was $27,000 greater than purchases. The $12,000 increase in interest payable should also be subtracted because it indicates that interest expense was greater than the cash paid to the lenders. Thus, the net adjustment to net cash inflow from operating activities is – $94,000 (– $38,000 + $31,000 – $27,000 – $48,000 – $12,000). Net income is $29,000 ($123,000 net cash inflow – $94,000 net adjustment).

Answer (B) is incorrect because The increase in interest payable is not subtracted.

Answer (C) is incorrect because Depreciation and the increase in interest payable are not subtracted.

Answer (D) is incorrect because Depreciation, the increase in accounts payable, the decrease in inventory, and the increase in interest payable should be subtracted, and the increase in net accounts receivable should be added.
[Fact Pattern #6]
Northern Exposure, Inc., had the following transactions during the year just ended:

- Proceeds from sale of land and building: $450,000
- Repurchase of common stock: 60,000
- Purchase of land for cash: 45,000
- Payment of cash dividend: 90,000
- Purchase of equipment for cash: 120,000
- Issuance of preferred stock: 66,000
- Cash repurchase of bonds: 100,000
- Issuance of a 5% common stock dividend: 50,000
- Recording of an asset and a liability for a capital lease: 100,000

Northern Exposure reported current net income of $290,000. During the year, accounts receivable increased by $22,000 and accounts payable decreased by $5,500. Depreciation expense was $20,000. Inventories increased by $11,000.

[91] (Refers to Fact Pattern #6)
Northern Exposure’s net cash provided by operating activities is

A. $271,500  
B. $293,500  
C. $310,000  
D. $348,500

- Answer (A) is correct. The net income of $290,000 must be adjusted for depreciation expense and changes in current assets. The calculation is:

  Net income $290,000  
  Depreciation expense 20,000  
  Increase in receivables (22,000)  
  Decrease in payables (5,500)  
  Increase in inventories (11,000)  
  Net cash provided $271,500

- Answer (B) is incorrect because the amount of $293,500 is the result of adding the inventory increase rather than deducting it.  
- Answer (C) is incorrect because the amount of $310,000 occurs by failing to adjust for the changes in current assets.  
- Answer (D) is incorrect because the amount of $348,500 is the result of reversing the treatment of all of the current asset changes.

[92] (Refers to Fact Pattern #6)
Northern Exposure’s net cash provided (used) by investing activities is

A. $185,000  
B. $225,000  
C. $285,000  
D. $351,000
Answer (A) is incorrect because the amount of $185,000 results from deducting the retirement of bonds, which is a financing activity.

Answer (B) is incorrect because the amount of $225,000 results from deducting the purchase of common stock, which is a financing activity.

Answer (C) is correct. Investing activities include buying and selling investments and property, plant, and equipment. However, entering into a capital lease is a noncash investing activity. The calculation is:

- Sale of land and building: $450,000
- Purchase of land: $(45,000)
- Purchase of equipment: $(120,000)
- Net cash provided: $285,000

Answer (D) is incorrect because the amount of $351,000 results from adding in the issuance of preferred stock, which is a financing activity.

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[93] (Refers to Fact Pattern #6)

Northern Exposure’s net cash provided (used) by financing activities is:

A. $66,000
B. $(24,000)
C. $(84,000)
D. $(184,000)

- Answer (A) is incorrect because the amount of $66,000 results from a failure to deduct the uses of cash.
- Answer (B) is incorrect because the amount of $(24,000) results from a failure to deduct the purchase of common stock and the retirement of bonds.
- Answer (C) is incorrect because the amount of $(84,000) results from a failure to deduct the retirement of bonds.
- Answer (D) is correct. Financing activities include the issuance of stock, payment of dividends, treasury stock transactions, and the issuance and retirement of debt. They also include receiving restricted resources that are donor-stipulated to be used for long-term purposes. However, the stock dividend is a noncash financing activity. The calculation is:

- Issuance of preferred stock: $66,000
- Repurchase of common stock: $(60,000)
- Payment of cash dividend: $(90,000)
- Repurchase of bonds: $(100,000)
- Net cash used: $(184,000)
The following data were extracted from the financial statements of a company for the year ended December 31:

- Net income: $70,000
- Depreciation expense: $14,000
- Amortization of intangible assets: $1,000
- Decrease in accounts receivable: $2,000
- Increase in inventories: $9,000
- Increase in accounts payable: $4,000
- Increase in plant assets: $47,000
- Increase in contributed capital: $31,000
- Decrease in short-term notes payable: $55,000

There were no disposals of plant assets during the year. Based on the above, a statement of cash flows will report a net increase in cash of

A. $11,000
B. $17,000
C. $54,000
D. $69,000

- Answer (A) is correct. Depreciation and amortization are noncash expenses and are added to net income. A decrease in receivables indicates that cash collections exceed sales on an accrual basis, so it is added to net income. To account for the difference between cost of goods sold (a deduction from income) and cash paid to suppliers, a two-step adjustment of net income is necessary. The difference between cost of goods sold and purchases is the change in inventory. The difference between purchases and the amount paid to suppliers is the change in accounts payable. Accordingly, the conversion of cost of goods sold to cash paid to suppliers requires deducting the inventory increase and adding the accounts payable increase. An increase in plant assets indicates an acquisition of plant assets, causing a decrease in cash, so it is deducted. An increase in contributed capital represents a cash inflow and is added to net income. A decrease in short-term notes payable is deducted from net income because it reflects a cash outflow. Thus, cash increased by $11,000 ($70,000 NI + $14,000 + $1,000 + $2,000 – $9,000 + $4,000 – $47,000 + $31,000 – $55,000).

- Answer (B) is incorrect because this amount results from subtracting the amortization and the decrease in receivables and adding the increase in inventories.

- Answer (C) is incorrect because this amount results from adjusting net income for the increase in plant assets and the increase in contributed capital only.

- Answer (D) is incorrect because this amount results from not making the adjustments for receivables, inventories, notes payable, and accounts payable.
Metro, Inc., reported current net income of $150,000. Changes occurred in several balance sheet accounts during the year as follows:

- **Investment in Videogold, Inc., stock, carried on the equity basis**: $5,500 increase
- **Accumulated depreciation, caused by major repair to projection equipment**: 2,100 decrease
- **Premium on bonds payable**: 1,400 decrease
- **Deferred income tax liability (long-term)**: 1,800 increase

In Metro’s current cash flow statement, the reported net cash provided by operating activities should be

A. $150,400
B. $148,300
C. $144,900
D. $142,800

- **Answer (A) is incorrect because** This amount results from omitting the adjustment for the equity-based investment.
- **Answer (B) is incorrect because** This amount results from omitting the adjustment for the equity-based investment and incorrectly subtracting the decrease in accumulated depreciation.
- **Answer (C) is correct**. The increase in the equity-based investment reflects the investor’s share of the investee’s net income after adjustment for dividends received. Hence, this increase is a noncash revenue and should be subtracted in the reconciliation of net income to net operating cash inflow. A major repair provides benefits to more than one period and therefore should not be expensed. One method of accounting for a major repair is to charge accumulated depreciation if the useful life of the asset has been extended, with the offsetting credit to cash, a payable, etc. However, the cash outflow, if any, is from an investing activity. The item has no effect on net income and no adjustment is necessary. Amortization of bond premium means that interest expense is less than cash paid out for interest, and should be subtracted in the reconciliation. The increase in the deferred tax liability is a noncash item that reduces net income and should be added in the reconciliation. Accordingly, net cash provided by operations is $144,900 ($150,000 – $5,500 – $1,400 + $1,800).
- **Answer (D) is incorrect because** This amount results from improperly subtracting the decrease in accumulated depreciation.

During the current year, Beck Co. purchased equipment for cash of $47,000, and sold equipment with a $10,000 carrying value for a gain of $5,000. How should these transactions be reported in Beck’s statement of cash flows?

A. Cash outflow of $32,000.
B. Cash outflow of $42,000.
C. Cash inflow of $5,000 and cash outflow of $47,000.
D. Cash inflow of $15,000 and cash outflow of $47,000.

- **Answer (A) is incorrect because** Cash inflows and outflows ordinarily are not netted.
- **Answer (B) is incorrect because** An outflow of $42,000 assumes netting and a $5,000 inflow.
- **Answer (C) is incorrect because** The cash inflow was $15,000. Beck received the $10,000 carrying value and a $5,000 gain.
- **Answer (D) is correct**. Investing activities include making and collecting loans and acquiring and disposing of debt or equity instruments and property, plant, and equipment and other productive assets, that is, assets held for or used in the production of goods or services (other than the materials held in inventory). Thus, the cash effects of purchases and sales of equipment should be reported in the investing cash flows section of the statement of cash flows. Moreover, cash inflows and outflows ordinarily are not netted. They should be reported separately at gross amounts. Accordingly, Beck should report a cash inflow of $15,000 ($10,000 carrying value + $5,000 gain) for the sale of equipment and a $47,000 outflow for the purchase. In adjusting accrual-based net income to net operating cash flow, the $5,000 gain on the sale of equipment should be subtracted to prevent double counting.
The Ayres Corporation owns extensive rental property. For some of this property, rent is paid in advance. For other property, rent is paid following the end of the year. In the income statement for the end of Year 2, Ayres reported $140,000 in rental income. The following data are included in Ayres’ balance sheet:

<table>
<thead>
<tr>
<th></th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent receivable</td>
<td>$95,000</td>
<td>$120,000</td>
</tr>
<tr>
<td>Deferred rent income</td>
<td>40,000</td>
<td>50,000</td>
</tr>
</tbody>
</table>

In its statement of cash flows for the end of Year 2, Ayres should report cash receipts from rental properties totaling

A. $105,000
B. $125,000
C. $155,000
D. $175,000

- Answer (A) is incorrect because The $25,000 decrease in rent receivable should be added to rental income, not subtracted.
- Answer (B) is incorrect because The $25,000 decrease in rent receivable should be added to rental income, not subtracted, and the $10,000 decrease in deferred rental income should be subtracted, not added.
- Answer (C) is correct. No write-offs of rent receivables are mentioned. Consequently, a decrease in the rent receivable asset account implies that Ayres collected more in cash receipts from rental customers than it recognized as rental income in Year 2. In contrast, a decrease in the deferred rent income liability account signifies that Ayres recognized more rental income than it received in cash payments. To determine cash receipts from rental properties, the rental income of $140,000 should be increased by the $25,000 change in the rent receivable account and decreased by the $10,000 reduction in the deferred rent income account. Cash receipts from rental properties were therefore $155,000.
- Answer (D) is incorrect because The $10,000 decrease in deferred rental income should be subtracted from rental income, not added.

What is the amount of the operating cash flow for a firm with $100,000 profit before tax, $20,000 depreciation expense, and a 35% marginal tax rate?

A. $65,000
B. $85,000
C. $92,000
D. $98,000

- Answer (A) is incorrect because The amount of $65,000 fails to consider that depreciation is a noncash expense.
- Answer (B) is correct. The tax on $100,000 would be $35,000. Note that depreciation would have already been deducted in calculating the $100,000 of before-tax profit. Thus, cash flows from operations must have been $120,000. Deducting the $35,000 of taxes from the $120,000 leaves net cash inflows of $85,000.
- Answer (C) is incorrect because The amount of $92,000 based taxes on $120,000 rather than $100,000.
- Answer (D) is incorrect because The amount of $98,000 based taxes on $80,000 rather than $100,000.
Zip Company entered into the following transactions during the year:

- Purchased stock for $200,000
- Purchased electronic equipment for use on the manufacturing floor for $300,000
- Paid dividends to shareholders of Zip Company in the amount of $800,000

The amount to be reported in the investing activities section of Zip’s statement of cash flows would be

A. $200,000  
B. $500,000  
C. $800,000  
D. $1,300,000

- Answer (A) is incorrect because The amount of $200,000 results from failing to include the purchase of manufacturing equipment.
- Answer (B) is correct. The statement of cash flows classifies an enterprise’s cash flows into three categories. Investing activities typically include the purchase and sale of securities of other entities and the purchase and sale of property, plant, and equipment. Thus, the amount to be reported in the investing activities section of Zip’s statement of cash flows is $500,000 ($200,000 + $300,000).
- Answer (C) is incorrect because The amount of $800,000 is the cash flows from financing activities.
- Answer (D) is incorrect because The amount of $1,300,000 results from improperly including the dividend payment.

In financial statement analysis, expressing all financial statement items as a percentage of base-year amounts is called

A. Horizontal common-size analysis.  
B. Vertical common-size analysis.  
C. Trend analysis.  
D. Ratio analysis.

- Answer (A) is correct. Expressing financial statement items as percentages of corresponding base-year figures is a horizontal form of common-size (percentage) analysis that is useful for evaluating trends. The base amount is assigned the value of 100%, and the amounts for other years are denominated in percentages compared to the base year.
- Answer (B) is incorrect because Vertical common-size (percentage) analysis presents figures for a single year expressed as percentages of a base amount on the balance sheet (e.g., total assets) and on the income statement (e.g., sales).
- Answer (C) is incorrect because The term “trend analysis” is most often applied to the quantitative techniques used in forecasting to fit a curve to given data.
- Answer (D) is incorrect because It is a general term.

On a common-size balance sheet, what would represent 100%?

A. Total current assets.  
B. Total assets.  
C. Total liabilities.  
D. Total stockholders’ equity.

- Answer (A) is incorrect because Total current assets would be less than total assets, which is always 100%.
Answer (B) is correct. On a common-size balance sheet, all amounts are converted to percentages with total assets representing 100%. Of course, if the balance sheet is in balance, the total of liabilities plus stockholders’ equity will also equal 100%.

Answer (C) is incorrect because Total liabilities would be less than total assets, which is always 100%.

Answer (D) is incorrect because Total stockholders’ equity would be less than total assets, which is always 100%.

[102] A company has the following summarized income statement:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,000</td>
</tr>
<tr>
<td>Sales returns and allowances</td>
<td>10</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>600</td>
</tr>
<tr>
<td>Gross profit</td>
<td>390</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>190</td>
</tr>
<tr>
<td>Income before taxes</td>
<td>200</td>
</tr>
<tr>
<td>Income taxes</td>
<td>70</td>
</tr>
<tr>
<td>Net income</td>
<td>130</td>
</tr>
</tbody>
</table>

Which of the following amounts would be converted to 100% on a common-size income statement?

A. $1,000  
B. $990   
C. $390   
D. $200

Answer (A) is incorrect because The amount of $1,000 fails to consider sales returns and allowances.  
Answer (B) is correct. Net sales represents 100% on a common-size income statement. Thus, sales of $1,000 minus returns and allowances of $10 results in net sales of $990.  
Answer (C) is incorrect because Net sales should be assigned as 100%.  
Answer (D) is incorrect because Net sales, not operating income, represents 100% on a common-size income statement.

[103] A company has provided the following data pertaining to one of its products.

<table>
<thead>
<tr>
<th>Year</th>
<th>Unit Sales</th>
<th>Unit Sales Price</th>
<th>Gross Profit Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1,000</td>
<td>$50</td>
<td>45%</td>
</tr>
<tr>
<td>2</td>
<td>1,200</td>
<td>$55</td>
<td>48%</td>
</tr>
</tbody>
</table>

Which one of the following statements is correct?

A. The cost per unit sold decreased 3% during Year 2.  
B. The dollar amount of gross profit increased by 3% during Year 2.  
C. The percentage increase in the sales price exceeded the percentage increase in the cost per unit sold during Year 2.  
D. The cost per unit increased during Year 2, in line with the increase in unit sales.

Answer (A) is incorrect because The change in cost per unit is not calculated by the difference in gross profit margin from Year 1 to Year 2. The cost per unit sold increased by 4%, not decreased by 3%, in Year 2.
Answer (B) is incorrect because the dollar amount of gross profit increased from $22,500 ($50,000 sales – $27,500 COGS) in Year 1 to $31,680 ($66,000 sales – $34,320 COGS) in Year 2. This represents an increase of 4.08% ($31,680 – $22,500 ÷ $22,500), not 3%.

Answer (C) is correct. Gross profit margin can be expressed as sales less COGS (gross profit) divided by sales. The Year 1 gross profit margin is given as 45%. This can be used to calculate the Year 1 COGS as follows:

\[ \frac{45\%}{50,000} = \frac{50,000 - \text{COGS}}{50,000} \]
\[ 22,500 = 50,000 - \text{COGS} \]
\[ \text{COGS} = 27,500 \]

Because the company sold 1000 units, the COGS per unit is equal to $27.50 ($27,500 ÷ 1000 units).

The Year 2 Gross Profit Margin is given as 48%. This can be used to calculate the Year 2 COGS as follows:

\[ \frac{48\%}{66,000} = \frac{66,000 - \text{COGS}}{66,000} \]
\[ 31,680 = 66,000 - \text{COGS} \]
\[ \text{COGS} = 34,320 \]

Because the company sold 1,200 units, the COGS per unit is equal to $28.60 ($32,320 ÷ 1200 units).

Sales price increased by 10% ($55 – $50 ÷ $50) while COGS increased by 4% ($28.60 – $27.50 ÷ $27.50). Thus, the percentage increase in the sales price exceeded the percentage increase in the cost per unit sold during Year 2.

Answer (D) is incorrect because If sales price increased by 10% ($55 – $50 ÷ $50) while COGS increased by 4% ($28.60 – $27.50 ÷ $27.50), then the percentage increase in the sales price exceeded the percentage increase in the cost per unit sold during Year 2.

[104] Given an acid test ratio of 2.0, current assets of $5,000, and inventory of $2,000, the value of current liabilities is

A. $1,500
B. $2,500
C. $3,500
D. $6,000

Answer (A) is correct. The acid test, or quick, ratio equals the quick assets (cash, marketable securities, and accounts receivable) divided by current liabilities. Current assets equal the quick assets plus inventory and prepaid expenses. (This question assumes that the entity has no prepaid expenses.) Given current assets of $5,000, inventory of $2,000, and no prepaid expenses, the quick assets must be $3,000. Because the acid test ratio is 2.0, the quick assets are double the current liabilities. Current liabilities therefore are equal to $1,500 ($3,000 quick assets ÷ 2.0).

Answer (B) is incorrect because Dividing the current assets by 2.0 results in $2,500. Current assets includes inventory, which should not be included in the calculation of the acid test ratio.

Answer (C) is incorrect because Adding inventory to current assets rather than subtracting it results in $3,500.

Answer (D) is incorrect because Multiplying the quick assets by 2 instead of dividing by 2 results in $6,000.
[Fact Pattern #7]

Tosh Enterprises reported the following account information:

<table>
<thead>
<tr>
<th></th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable</td>
<td>$400,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>260,000</td>
</tr>
<tr>
<td>Bonds payable, due in 10 years</td>
<td>600,000</td>
</tr>
<tr>
<td>Cash</td>
<td>200,000</td>
</tr>
<tr>
<td>Interest payable, due in 3 months</td>
<td>20,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>$800,000</td>
</tr>
<tr>
<td>Land</td>
<td>500,000</td>
</tr>
<tr>
<td>Short-term prepaid expense</td>
<td>80,000</td>
</tr>
</tbody>
</table>

The current ratio for Tosh Enterprises is

A. 1.68
B. 2.14
C. 5.00
D. 5.29

- Answer (A) is incorrect because the figure of 1.68 includes long-term bonds payable among the current liabilities.
- Answer (B) is incorrect because the figure of 2.14 is the quick ratio.
- Answer (C) is incorrect because the figure of 5.00 excludes prepaid expenses from current assets.
- Answer (D) is correct. The current ratio equals current assets divided by current liabilities. Current assets consist of cash, accounts receivable, inventory, and prepaid expenses, a total of $1,480,000 ($400,000 + $200,000 + $800,000 + $80,000). Current liabilities consist of accounts payable, interest payable, and notes payable, a total of $280,000 ($160,000 + $20,000 + $100,000). Hence, the current ratio is 5.29 ($1,480,000 ÷ $280,000).

What is Tosh Enterprises’ quick (acid test) ratio?

A. 0.68
B. 1.68
C. 2.14
D. 2.31

- Answer (A) is incorrect because this ratio includes long-term bonds payable among the current liabilities.
- Answer (B) is incorrect because this ratio includes long-term bonds payable among the current liabilities and inventory and prepaid expenses among the quick assets.
- Answer (C) is correct. The quick (acid test) ratio equals the quick assets divided by current liabilities. For Tosh, quick assets consist of cash ($200,000) and accounts receivable ($400,000), a total of $600,000. Current liabilities consist of accounts payable ($160,000), interest payable ($20,000), and notes payable ($100,000), a total of $280,000. Hence, the quick ratio is 2.14 ($600,000 ÷ $280,000).
- Answer (D) is incorrect because this ratio excludes interest payable from the current liabilities.
[107] (Refers to Fact Pattern #7)
Tosh Enterprises’ amount of working capital is

A. $600,000  
B. $1,120,000  
C. $1,200,000  
D. $1,220,000

- Answer (A) is incorrect because the amount of $600,000 includes long-term bonds payable among the current liabilities.
- Answer (B) is incorrect because the amount of $1,120,000 excludes prepaid expenses from current assets.
- Answer (C) is correct. Working capital equals current assets minus current liabilities. For Tosh Enterprises, current assets consist of cash, accounts receivable, inventory, and prepaid expenses, a total of $1,480,000 ($400,000 + $200,000 + $800,000 + $80,000). Current liabilities consist of accounts payable, interest payable, and notes payable, a total of $280,000 ($160,000 + $20,000 + $100,000). Accordingly, working capital is $1,200,000 ($1,480,000 – $280,000).
- Answer (D) is incorrect because the amount of $1,220,000 excludes interest payable from current liabilities.

[Fact Pattern #8]
The selected data pertain to Tilghman Company at December 31:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick assets</td>
<td>$208,000</td>
</tr>
<tr>
<td>Acid test ratio</td>
<td>2.6 to 1</td>
</tr>
<tr>
<td>Current ratio</td>
<td>3.5 to 1</td>
</tr>
<tr>
<td>Net sales for the year</td>
<td>$1,800,000</td>
</tr>
<tr>
<td>Cost of sales for the year</td>
<td>$990,000</td>
</tr>
<tr>
<td>Average total assets for the year</td>
<td>$1,200,000</td>
</tr>
</tbody>
</table>

[108] (Refers to Fact Pattern #8)
Tilghman Company’s current liabilities at December 31 equal

A. $59,429  
B. $80,000  
C. $134,857  
D. $187,200

- Answer (A) is incorrect because the current liabilities at year end are determined using the quick assets total and the acid test ratio: Current liabilities equals the quick assets divided by the acid test ratio.
- Answer (B) is correct. Current liabilities can be calculated using the following relationship:
  
  \[
  \text{Acid test ratio} = \frac{\text{Quick assets}}{\text{Current liabilities}} \\
  2.6 = \frac{208,000}{\text{Current liabilities}} \\
  \text{Current liabilities} = \frac{208,000 \times 2.6}{2.6} = \frac{208,000}{2.6} = \frac{80,000}{\text{Current liabilities}}
  \]
- Answer (C) is incorrect because the current liabilities at year end are determined using the quick assets total and the acid test ratio: Current liabilities equals the quick assets divided by the acid test ratio.
Answer (D) is incorrect because the current liabilities at year end are determined using the quick assets total and the acid test ratio. Current liabilities equal the quick assets divided by the acid test ratio.

[109] (Refers to Fact Pattern #8)

Tilghman Company’s inventory balance at December 31 is

- A. $72,000
- B. $187,200
- C. $231,111
- D. $282,857

Answer (A) is correct. Ending inventory can be calculated using the following relationships:

\[
\text{Acid test ratio} = \frac{\text{Quick assets}}{\text{Current liabilities}}
\]

\[
2.6 = \frac{\$208,000}{\text{Current liabilities}}
\]

\[
\text{Current liabilities} \times 2.6 = \$208,000
\]

\[
\text{Current liabilities} = \frac{\$208,000}{2.6} = \$80,000
\]

\[
\text{Current assets} \div \text{Current liabilities} = \text{Current ratio}
\]

\[
\text{Current assets} \div \$80,000 = 3.5
\]

\[
\text{Current assets} = \$280,000
\]

Assuming that Tilghman has no prepaid expenses, inventory is the only difference between current assets and quick assets. Thus, the ending balance of inventory must be $72,000 ($280,000 – $208,000).

Answer (B) is incorrect because inventory equals the difference between current assets and quick assets (assuming no prepaid expenses). Multiplying the current liabilities by the current ratio gives the current assets. Subtracting the quick assets from the current assets gives the inventory balance.

Answer (C) is incorrect because inventory equals the difference between current assets and quick assets (assuming no prepaid expenses). Multiplying the current liabilities by the current ratio gives the current assets. Subtracting the quick assets from the current assets gives the inventory balance.

Answer (D) is incorrect because inventory equals the difference between current assets and quick assets (assuming no prepaid expenses). Multiplying the current liabilities by the current ratio gives the current assets. Subtracting the quick assets from the current assets gives the inventory balance.
A financial analyst has obtained the following data from Kryton Industries’ financial statements:

<table>
<thead>
<tr>
<th>Asset</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$200,000</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>100,000</td>
</tr>
<tr>
<td>Accounts receivable, net</td>
<td>300,000</td>
</tr>
<tr>
<td>Inventories, net</td>
<td>480,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>120,000</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$1,200,000</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liability</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$250,000</td>
</tr>
<tr>
<td>Income taxes</td>
<td>50,000</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>100,000</td>
</tr>
<tr>
<td>Current portion of long-term debt</td>
<td>200,000</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$600,000</strong></td>
</tr>
</tbody>
</table>

In order to determine Kryton’s ability to pay current obligations, the financial analyst would calculate Kryton’s cash ratio as

### A. .50
### B. .80
### C. 1.00
### D. 1.20

- Answer (A) is correct. The cash ratio, a more conservative measure of liquidity than the quick ratio, is calculated as follows:

\[
\text{Cash ratio} = \frac{\text{Cash} + \text{Marketable securities}}{\text{Current liabilities}} = \frac{200,000 + 100,000}{600,000} = 0.5
\]

- Answer (B) is incorrect because improperly including only inventories in the numerator results in a ratio of .80.
- Answer (C) is incorrect because improperly including accounts receivable in the numerator results in a ratio of 1.00.
- Answer (D) is incorrect because improperly including accounts receivable and prepaid expenses in the numerator results in a ratio of 1.20.
The following financial information applies to Sycamore Company:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$10,000</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>18,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>120,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>375,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>12,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>75,000</td>
</tr>
<tr>
<td>Long-term debt -- current portion</td>
<td>20,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>400,000</td>
</tr>
<tr>
<td>Sales</td>
<td>1,650,000</td>
</tr>
</tbody>
</table>

What is the acid test (or quick) ratio for Sycamore?

A. 1.56
B. 1.97
C. 2.13
D. 5.63

- Answer (A) is correct. The acid test (quick) ratio equals the quick assets (cash, marketable securities, and accounts receivable) divided by current liabilities. Sycamore’s acid test ratio is thus 1.558 \([($10,000 + $18,000 + $120,000) ÷ ($75,000 + $20,000)]\).
- Answer (B) is incorrect because Improperly leaving the current portion of long-term debt from the denominator results in 1.9.
- Answer (C) is incorrect because Improperly including prepaid expenses in the numerator and leaving the current portion of long-term debt out of the denominator results in 2.13.
- Answer (D) is incorrect because Improperly including inventories and prepaid expenses in the numerator results in 5.63.
[Fact Pattern #9]
The information below pertains to Devlin Company.

<table>
<thead>
<tr>
<th>Statement of Financial Position as of May 31</th>
<th>Income Statement for the year ended May 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>(in thousands)</td>
<td></td>
</tr>
<tr>
<td><strong>Year 2</strong></td>
<td><strong>Year 1</strong></td>
</tr>
<tr>
<td>Assets</td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td></td>
</tr>
<tr>
<td>Cash $ 45 $ 38</td>
<td>Costs and expenses</td>
</tr>
<tr>
<td>Trading securities 30 20</td>
<td>Selling, general, and administrative 52 51</td>
</tr>
<tr>
<td>Accounts receivable (net) 68 48</td>
<td>Interest expense 8 9</td>
</tr>
<tr>
<td>Inventory 90 80</td>
<td>Income before taxes $ 90 $ 85</td>
</tr>
<tr>
<td>Prepaid expenses 22 30</td>
<td>Income taxes 36 34</td>
</tr>
<tr>
<td>Total current assets $255 $216</td>
<td>Net income $ 54 $ 51</td>
</tr>
<tr>
<td>Investments, at equity 38 30</td>
<td></td>
</tr>
<tr>
<td>Property, plant, and equipment (net) 375 400</td>
<td></td>
</tr>
<tr>
<td>Intangible assets (net) 80 45</td>
<td></td>
</tr>
<tr>
<td>Total assets $748 $691</td>
<td></td>
</tr>
<tr>
<td>Liabilities</td>
<td></td>
</tr>
<tr>
<td>Current liabilities</td>
<td></td>
</tr>
<tr>
<td>Notes payable $ 35 $ 18</td>
<td></td>
</tr>
<tr>
<td>Accounts payable 70 42</td>
<td></td>
</tr>
<tr>
<td>Accrued expenses 5 4</td>
<td></td>
</tr>
<tr>
<td>Income taxes payable 15 16</td>
<td></td>
</tr>
<tr>
<td>Total current liabilities $125 $ 80</td>
<td></td>
</tr>
<tr>
<td>Long-term debt 35 35</td>
<td></td>
</tr>
<tr>
<td>Deferred taxes 3 2</td>
<td></td>
</tr>
<tr>
<td>Total liabilities $163 $117</td>
<td></td>
</tr>
<tr>
<td>Equity</td>
<td></td>
</tr>
<tr>
<td>Preferred stock, 6%, $100 par value,</td>
<td></td>
</tr>
<tr>
<td>cumulative $150 $150</td>
<td></td>
</tr>
<tr>
<td>Common stock, $10 par value 225 195</td>
<td></td>
</tr>
<tr>
<td>Additional paid-in capital -- common stock 114 100</td>
<td></td>
</tr>
<tr>
<td>Retained earnings 96 129</td>
<td></td>
</tr>
<tr>
<td>Total equity $585 $574</td>
<td></td>
</tr>
<tr>
<td>Total liabilities and equity $748 $691</td>
<td></td>
</tr>
</tbody>
</table>

[112] (Refers to Fact Pattern #9)
Devlin Company’s acid test ratio at May 31, Year 2, was

A. 0.60 to 1.
B. 0.90 to 1.
C. 1.14 to 1.
D. 1.86 to 1.

- Answer (A) is incorrect because the ratio of 0.60 to 1 omits receivables.
- Answer (B) is incorrect because the ratio of 0.90 to 1 omits trading securities.
• Answer (C) is correct. The acid test, or quick, ratio equals quick assets (cash, trading securities, and accounts receivable) divided by current liabilities. Quick assets total $143 ($45 + $30 + $68), so the acid test ratio is 1.14 ($143 ÷ $125 current liabilities).

• Answer (D) is incorrect because the ratio of 1.86 to 1 includes inventory among quick assets.

**[Fact Pattern #10]**

The Statement of Financial Position for King Products Corporation for the fiscal years ended June 30, Year 2, and June 30, Year 1, is presented below. Net sales and cost of goods sold for the year ended June 30, Year 2, were $600,000 and $440,000, respectively.

King Products Corporation  
Statement of Financial Position  
(in thousands)

<table>
<thead>
<tr>
<th></th>
<th>June 30 Year 2</th>
<th></th>
<th>June 30 Year 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 60</td>
<td></td>
<td>$ 50</td>
<td></td>
</tr>
<tr>
<td>Marketable securities (at market)</td>
<td>40</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>90</td>
<td>60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>120</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prepaid items</td>
<td>30</td>
<td></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Total current assets</td>
<td>$ 340</td>
<td></td>
<td>$ 280</td>
<td></td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>$ 200</td>
<td></td>
<td>$ 190</td>
<td></td>
</tr>
<tr>
<td>Building (net)</td>
<td>160</td>
<td></td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>190</td>
<td></td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Patents (net)</td>
<td>70</td>
<td></td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>40</td>
<td></td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Total long-term assets</td>
<td>$ 660</td>
<td>$ 630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total assets</td>
<td>$1,000</td>
<td></td>
<td>$910</td>
<td></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$ 46</td>
<td></td>
<td>$ 24</td>
<td></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>94</td>
<td></td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Accrued interest</td>
<td>30</td>
<td></td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$ 170</td>
<td>$ 110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable, 10% due 12/31/Year 7</td>
<td>$ 20</td>
<td>$ 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonds payable, 12% due 6/30/Year 10</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total long-term debt</td>
<td>$ 50</td>
<td></td>
<td>$ 50</td>
<td></td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$ 220</td>
<td></td>
<td>$160</td>
<td></td>
</tr>
<tr>
<td>Preferred stock -- 5% cumulative, $100 par, nonparticipating, authorized, issued and outstanding, 2,000 shares</td>
<td>$ 200</td>
<td>$200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common stock -- $10 par, 40,000 shares authorized, 30,000 shares issued and outstanding</td>
<td>$ 300</td>
<td>$300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional paid-in capital -- common</td>
<td>$ 150</td>
<td>$150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Retained earnings</td>
<td>130</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Total equity</td>
<td>$ 780</td>
<td></td>
<td>$750</td>
<td></td>
</tr>
<tr>
<td>Total liabilities &amp; equity</td>
<td>$1,000</td>
<td>$910</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
[113] (Refers to Fact Pattern #10)

King Products Corporation’s quick (acid test) ratio at June 30, Year 2, was

A. 0.6  
B. 1.1  
C. 1.8  
D. 2.0  

- Answer (A) is incorrect because the figure of 0.6 omits receivables. 
- Answer (B) is correct. The quick (acid test) ratio equals quick assets divided by current liabilities. King’s quick assets consist of cash, receivables, and marketable securities. Accordingly, the quick ratio is 1.11 \( \frac{[(60 \text{ cash} + 40 \text{ marketable securities} + 90 \text{ accounts receivable})]}{170 \text{ current liabilities}} \). 
- Answer (C) is incorrect because the figure of 1.8 includes inventories. 
- Answer (D) is incorrect because the figure of 2.0 is the current ratio.

[Fact Pattern #11]

The data presented below show actual figures for selected accounts of McKeon Company for the fiscal year ended May 31, Year 1, and selected budget figures for the Year 2 fiscal year. McKeon’s controller is in the process of reviewing the Year 2 budget and calculating some key ratios based on the budget. McKeon Company monitors yield or return ratios using the average financial position of the company. (Round all calculations to three decimal places if necessary.)

<table>
<thead>
<tr>
<th></th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$210,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Noncurrent assets</td>
<td>275,000</td>
<td>255,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>78,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>75,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Common stock ($30 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>32,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Year 2 Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales*</td>
<td>$350,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>160,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>3,000</td>
</tr>
<tr>
<td>Income taxes (40% rate)</td>
<td>48,000</td>
</tr>
<tr>
<td>Dividends declared and paid in Year 2</td>
<td>60,000</td>
</tr>
<tr>
<td>Administrative expense</td>
<td>67,000</td>
</tr>
</tbody>
</table>

*All sales are credit sales.

<table>
<thead>
<tr>
<th></th>
<th>Current Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5/31/Year 2</td>
</tr>
<tr>
<td>Cash</td>
<td>$20,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>100,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>70,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>20,000</td>
</tr>
</tbody>
</table>
McKeon Company’s current ratio for Year 2 is

A. 1.373
B. 1.176
C. 2.118
D. 2.692

- Answer (A) is incorrect because the current ratio equals current assets divided by current liabilities.
- Answer (B) is incorrect because the current ratio equals current assets divided by current liabilities.
- Answer (C) is incorrect because the current ratio equals current assets divided by current liabilities.
- Answer (D) is correct. The current ratio equals the ratio of current assets to current liabilities. Dividing $210,000 of current assets at year end by $78,000 of current liabilities at year end results in a current ratio of 2.692.

A service company’s working capital at the beginning of January of the current year was $70,000. The following transactions occurred during January:

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performed services on account</td>
<td>$30,000</td>
</tr>
<tr>
<td>Purchased supplies on account</td>
<td>5,000</td>
</tr>
<tr>
<td>Consumed supplies</td>
<td>4,000</td>
</tr>
<tr>
<td>Purchased office equipment for cash</td>
<td>2,000</td>
</tr>
<tr>
<td>Paid short-term bank loan</td>
<td>6,500</td>
</tr>
<tr>
<td>Paid salaries</td>
<td>10,000</td>
</tr>
<tr>
<td>Accrued salaries</td>
<td>3,500</td>
</tr>
</tbody>
</table>

What is the amount of working capital at the end of January?

A. $90,000
B. $80,500
C. $50,500
D. $47,500

- Answer (A) is incorrect because the amount of $90,000 ignores the consumed supplies, the cash purchase of office equipment, and the accrued salaries.
- Answer (B) is correct. Working capital is the excess of total current assets (CA) over total current liabilities (CL). Thus, working capital at the end of January equals $80,500 computed as follows:

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Amount</th>
<th>Current Assets*</th>
<th>Current Liabilities*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning working capital</td>
<td>$70,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performed services on account</td>
<td>30,000</td>
<td>I</td>
<td>N</td>
</tr>
<tr>
<td>Purchased supplies on account</td>
<td>0</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Consumed supplies</td>
<td>(4,000)</td>
<td>D</td>
<td>N</td>
</tr>
<tr>
<td>Purchased office equipment for cash</td>
<td>(2,000)</td>
<td>D</td>
<td>N</td>
</tr>
<tr>
<td>Paid short-term bank loan</td>
<td>0</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>Paid salaries</td>
<td>(10,000)</td>
<td>D</td>
<td>N</td>
</tr>
<tr>
<td>Accrued salaries</td>
<td>(3,500)</td>
<td>N</td>
<td>I</td>
</tr>
<tr>
<td><strong>Working capital, end of January</strong></td>
<td><strong>$80,500</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* N = no effect; I = increase; D = decrease
Answer (C) is incorrect because the amount of $50,500 does not include the services performed on account.
Answer (D) is incorrect because the amount of $47,500 omits the services performed on account and accrued salaries but includes the repayment of short-term loan.

[Fact Pattern #12]

CPZ Enterprises had the following account information.

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable</td>
<td>$200,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$80,000</td>
</tr>
<tr>
<td>Bonds payable, due in 10 years</td>
<td>$300,000</td>
</tr>
<tr>
<td>Cash</td>
<td>$100,000</td>
</tr>
<tr>
<td>Interest payable, due in 3 months</td>
<td>$10,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>$400,000</td>
</tr>
<tr>
<td>Land</td>
<td>$250,000</td>
</tr>
<tr>
<td>Notes payable, due in 6 months</td>
<td>$50,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>$40,000</td>
</tr>
</tbody>
</table>

The company has an operating cycle of 5 months.

[116] (Refers to Fact Pattern #12)

The current ratio for CPZ Enterprises is

A. 1.68
B. 2.14
C. 5.00
D. 5.29

- Answer (A) is incorrect because treating bonds payable as a current liability results in 1.68.
- Answer (B) is incorrect because the quick ratio is 2.14.
- Answer (C) is incorrect because excluding prepaid expenses from current assets results in 5.00.
- Answer (D) is correct. The current ratio equals current assets divided by current liabilities. This company’s current assets consist of cash, accounts receivable, inventory, and prepaid expenses, a total of $740,000 ($100,000 + $200,000 + $400,000 + $40,000). The current liabilities consist of accounts payable, interest payable, and notes payable, which total $140,000 ($80,000 + $10,000 + $50,000). Thus, the current ratio is 5.29 ($740,000 ÷ $140,000).

[117] (Refers to Fact Pattern #12)

What is CPZ’s acid test (quick) ratio?

A. 0.68
B. 1.68
C. 2.14
D. 2.31
Answer (A) is incorrect because the quick assets divided by the sum of the current liabilities and the bonds payable equal 0.68.

Answer (B) is incorrect because the quick assets divided by the sum of the current liabilities and the bonds payable equal 1.68.

Answer (C) is correct. The acid test, or quick, ratio equals quick assets divided by current liabilities. Quick assets consist of cash ($100,000) and accounts receivable ($200,000), for a total of $300,000. The current liabilities consist of accounts payable, interest payable, and notes payable, for a total of $140,000 ($80,000 + $10,000 + $50,000). Hence, the quick ratio is 2.14 ($300,000 ÷ $140,000).

Answer (D) is incorrect because omitting interest payable from the current liabilities results in 2.31.

Beatnik Company has a current ratio of 2.5 and a quick ratio of 2.0. If the firm experienced $2 million in cost of sales and sustains an inventory turnover of 8.0, what are the firm’s current assets?

A. $1,000,000
B. $500,000
C. $1,500,000
D. $1,250,000

Answer (A) is incorrect because the amount of quick assets is $1,000,000.

Answer (B) is incorrect because the amount of current liabilities is $500,000.

Answer (C) is incorrect because adding inventory to current assets results in $1,500,000.

Answer (D) is correct. The only major difference between the current ratio and the quick ratio is the inclusion of inventory in the numerator. If cost of sales is $2 million and inventory turns over 8 times per year, then average inventory is $250,000 ($2,000,000 ÷ 8). Since the only difference between the two ratios is inventory, then inventory must equal .5 (2.5 – 2.0) times current liabilities; therefore, current liabilities are $500,000. Thus, current assets divided by $500,000 equals 2.5. Therefore, current assets must equal $1,250,000 (2.5 × $500,000).
Lisa, Inc.
Statement of Financial Position
December 31, Year 2
(000s)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current assets:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$ 30</td>
<td>$ 25</td>
</tr>
<tr>
<td>Trading securities</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>170</td>
<td>140</td>
</tr>
<tr>
<td><strong>Long-term investments:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Securities (at cost)</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td><strong>Property, plant, &amp; equipment:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Building (net)</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td><strong>Intangible assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patents (net)</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total long-term assets</strong></td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$500</td>
<td>$455</td>
</tr>
</tbody>
</table>

| Liabilities & Shareholders’ Equity       |        |        |
| Current liabilities:                    |        |        |
| Notes payable                           | $ 23   | $ 12   |
| Accounts payable                        | 47     | 28     |
| Accrued interest                        | 15     | 15     |
| **Total current liabilities**           | 85     | 55     |
| Long-term debt:                         |        |        |
| Notes payable 10% due 12/31/Year 9      | 10     | 10     |
| Bonds payable 12% due 12/31/Year 8      | 15     | 15     |
| **Total long-term debt**                | 25     | 25     |
| **Total liabilities**                   | $110   | $ 80   |
| Shareholders’ equity:                   |        |        |
| Preferred -- 5% cumulative, $100 par,   |        |        |
| non-participating, 1,000 shares         | $100   | $100   |
| authorized, issued and outstanding      |        |        |
| Common -- $10 par 20,000 shares         | 150    | 150    |
| authorized, 15,000 issued and outstanding shares |        |        |
| Additional paid-in capital -- common    | 75     | 75     |
| Retained earnings                       | 65     | 50     |
| **Total shareholders’ equity**          | $390   | $375   |
| **Total liabilities & equity**          | $500   | $455   |
Lisa, Inc.’s acid test (quick) ratio at December 31, Year 2, was

A. 1.1:1.0
B. 1.8:1.0
C. 2.0:1.0
D. 2.5:1.0

- Answer (A) is **correct**. The acid test, or quick, ratio is calculated by dividing total quick assets by current liabilities. Quick assets are those that can be quickly converted into cash. Besides cash, they include trading securities and accounts receivable. Lisa’s quick assets total $95,000 ($30,000 + $20,000 + $45,000). Dividing $95,000 by the $85,000 of current liabilities results in a ratio of 1.1.
- Answer (B) is incorrect because **Erroneously including inventories in the numerator results in 1.8.**
- Answer (C) is incorrect because The ratio 2.0 is obtained by dividing total current assets by total current liabilities.
- Answer (D) is incorrect because The quick ratio must be less than the current ratio.

A condensed comparative balance sheet for a company appears below:

<table>
<thead>
<tr>
<th></th>
<th>12/31/Year 1</th>
<th>12/31/Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 40,000</td>
<td>$ 30,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>120,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>200,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Property, plant, &amp; equipment</td>
<td>500,000</td>
<td>550,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(280,000)</td>
<td>(340,000)</td>
</tr>
<tr>
<td>Total assets</td>
<td>$ 580,000</td>
<td>$ 640,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>$ 60,000</td>
<td>$ 100,000</td>
</tr>
<tr>
<td>Long-term liabilities</td>
<td>390,000</td>
<td>420,000</td>
</tr>
<tr>
<td>Stockholders’ equity</td>
<td>130,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Total liabilities and equity</td>
<td>$ 580,000</td>
<td>$ 640,000</td>
</tr>
</tbody>
</table>

In looking at liquidity ratios at both balance sheet dates, what happened to the (1) current ratio and (2) acid test (quick) ratio?

<table>
<thead>
<tr>
<th></th>
<th>(1) Current Ratio</th>
<th>(2) Acid Test Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Increased</td>
<td>Increased</td>
</tr>
<tr>
<td>B.</td>
<td>Increased</td>
<td>Decreased</td>
</tr>
<tr>
<td>C.</td>
<td>Decreased</td>
<td>Increased</td>
</tr>
<tr>
<td>D.</td>
<td>Decreased</td>
<td>Decreased</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Both ratios decreased.
- Answer (B) is incorrect because Both ratios decreased.
- Answer (C) is incorrect because Both ratios decreased.
● Answer (D) is correct. The current ratio is determined by dividing current assets by current liabilities. The acid test ratio is determined by dividing quick assets by current liabilities. At December 31, Year 1, the current ratio is 6 to 1 \([\frac{\$40,000 + \$120,000 + \$200,000}{\$60,000}]\). At December 31, Year 2, the current ratio is 4.3 to 1 \([\frac{\$30,000 + \$100,000 + \$300,000}{\$100,000}]\). Hence, there was a decrease in the current ratio. At December 31, Year 1, the acid test ratio is 2.667 to 1 \([\frac{\$40,000 + \$120,000}{\$60,000}]\). At December 31, Year 2, the acid test ratio is 1.3 to 1 \([\frac{\$30,000 + \$100,000}{\$100,000}]\). Thus, the acid test ratio also declined.

---

[Fact Pattern #14]
A company has a current ratio of 1.4, a quick, or acid test, ratio of 1.2, and the following partial summary balance sheet:

<table>
<thead>
<tr>
<th>Cash</th>
<th>$ 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable</td>
<td>___</td>
</tr>
<tr>
<td>Inventory</td>
<td>___</td>
</tr>
<tr>
<td>Fixed assets</td>
<td>___</td>
</tr>
<tr>
<td>Total assets</td>
<td>$100</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>___</td>
</tr>
<tr>
<td>Long-term liabilities</td>
<td>40</td>
</tr>
<tr>
<td>Stockholders’ equity</td>
<td>30</td>
</tr>
<tr>
<td>Total liabilities and equity</td>
<td>___</td>
</tr>
</tbody>
</table>

(Refers to Fact Pattern #14)
The company has an accounts receivable balance of

A. $26  
B. $36  
C. $66  
D. $100

● Answer (A) is correct. Total assets equal total liabilities and equity. Hence, if total assets equal $100, total liabilities and equity must equal $100, and current liabilities must equal $30 ($100 – $40 – $30). Because the quick ratio equals the quick assets (cash + accounts receivable) divided by current liabilities, the quick assets must equal $36 ($30 × 1.2 quick ratio), and the accounts receivable balance is $26 ($36 – $10 cash).

● Answer (B) is incorrect because The quick assets equal $36.

● Answer (C) is incorrect because The sum of the quick assets and current liabilities equals $66.

● Answer (D) is incorrect because Total assets equal $100.

[122] (Refers to Fact Pattern #14)
The company has a fixed assets balance of

A. $16  
B. $58  
C. $64  
D. $84

● Answer (A) is incorrect because Neglecting to subtract the equity balance when calculating the current liability balance results in $16.
• Answer (B) is correct. Total assets (given as $100) equals the sum of cash (given as $10), accounts receivable ($26 as calculated using the quick ratio), inventory, and fixed assets. Inventory can be determined because it is included in current, but not quick, assets, and the current and quick ratios are known. Current assets equal $42 (1.4 current ratio × $30 current liabilities), and the quick assets equal $36 (1.2 quick ratio × $30 current liabilities). Thus, inventory, which is the only difference in this question between current and quick assets, equals $6 ($42 – $36). Fixed assets must then equal $58 ($100 total assets – $10 cash – $26 accounts receivable – $6 inventory).

• Answer (C) is incorrect because Assuming that inventory is $0 results in $64.

• Answer (D) is incorrect because Ignoring accounts receivable results in $84.
### RST Corporation Comparative Income Statements for the Years 5 and 6

<table>
<thead>
<tr>
<th></th>
<th>Year 6</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (all are credit)</td>
<td>$285,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>150,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$135,000</td>
<td>$ 80,000</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
<td>65,000</td>
<td>36,000</td>
</tr>
<tr>
<td>Income before interest and income taxes</td>
<td>$ 70,000</td>
<td>$ 44,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>$ 67,000</td>
<td>$ 41,000</td>
</tr>
<tr>
<td>Income tax expense</td>
<td>27,000</td>
<td>16,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 40,000</td>
<td>$ 25,000</td>
</tr>
</tbody>
</table>

### RST Corporation Comparative Balance Sheets End of Years 5 and 6

<table>
<thead>
<tr>
<th></th>
<th>Year 6</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$ 5,000</td>
<td>$ 4,000</td>
</tr>
<tr>
<td>Short-term marketable investments</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>16,000</td>
<td>14,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>30,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$ 54,000</td>
<td>$ 40,000</td>
</tr>
<tr>
<td>Noncurrent assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term investments</td>
<td>11,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Property, plant, and equipment</td>
<td>80,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Intangibles</td>
<td>3,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Total assets</td>
<td>$148,000</td>
<td>$125,000</td>
</tr>
</tbody>
</table>

### Liabilities and Stockholders’ Equity

<table>
<thead>
<tr>
<th></th>
<th>Year 6</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current liabilities:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$ 11,000</td>
<td>$ 7,000</td>
</tr>
<tr>
<td>Accrued payables</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$ 12,000</td>
<td>$ 8,000</td>
</tr>
<tr>
<td>Long-term Liabilities:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0% Bonds payable, due in Year 12</td>
<td>30,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$ 42,000</td>
<td>$ 38,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stockholders’ equity:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Common stock, 2,400 shares, $10 par</td>
<td>$ 24,000</td>
<td>$ 24,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>82,000</td>
<td>63,000</td>
</tr>
<tr>
<td>Total stockholders’ equity</td>
<td>$106,000</td>
<td>$ 87,000</td>
</tr>
<tr>
<td>Total liabilities and stockholders’ equity</td>
<td>$148,000</td>
<td>$125,000</td>
</tr>
</tbody>
</table>

The market value of RST’s common stock at the end of Year Six was $100.00 per share.
(Refers to Fact Pattern #15)

RST’s acid test (or quick) ratio at the end of Year 6 is

A. 2.40 to 1.
B. 2.18 to 1.
C. 2.00 to 1.
D. 1.50 to 1.

- Answer (A) is incorrect because Dividing total current liabilities ($12,000) by the amount of cash ($5,000) results in 2.4, which produces no meaningful ratio.
- Answer (B) is incorrect because Dividing quick assets ($5,000 + $3,000 + $16,000) by accounts payable ($11,000) results in 2.18. The denominator should include all current liabilities.
- Answer (C) is correct. Liquidity ratios measure the ability of a company to meet its short-term obligations. A commonly used liquidity ratio is the acid test or quick ratio, which equals the sum of the quick assets (net accounts receivable, short-term marketable securities, and cash) divided by current liabilities. This ratio at the end of Year Six is 2.0 ($5,000 + $3,000 + $16,000) + $12,000.
- Answer (D) is incorrect because Dividing total current liabilities ($12,000) by the sum of cash ($5,000) and short-term marketable investments ($3,000) results in 1.5, which produces no meaningful ratio.

[Fact Pattern #16]

Broomall Corporation has decided to include certain financial ratios in its year-end annual report to shareholders. Selected information relating to its most recent fiscal year is provided below.

| Cash | $ 10,000 |
| Accounts receivable: | |
| – Beginning of year | 24,000 |
| – End of year | 20,000 |
| Prepaid expenses | 8,000 |
| Inventory: | |
| – Beginning of year | 26,000 |
| – End of year | 30,000 |
| Available-for-sale securities: | |
| – Historical cost | 9,000 |
| – Fair value at year end | 12,000 |
| Accounts payable | 15,000 |
| Notes payable (due in 90 days) | 25,000 |
| Bonds payable (due in 10 years) | 35,000 |
| Net credit sales for year | 220,000 |
| Cost of goods sold | 140,000 |

(Refers to Fact Pattern #16)

Broomall’s working capital at year end is

A. $40,000
B. $37,000
C. $28,000
D. $10,000
Answer (A) is correct. Working capital consists of current assets net of current liabilities. Broomall’s working capital at year end can thus be calculated as follows:

<table>
<thead>
<tr>
<th>Asset</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$10,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>20,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>8,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>30,000</td>
</tr>
<tr>
<td>Available-for-sale securities</td>
<td>12,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>(15,000)</td>
</tr>
<tr>
<td>Notes payable</td>
<td>(25,000)</td>
</tr>
<tr>
<td><strong>Working capital</strong></td>
<td><strong>$40,000</strong></td>
</tr>
</tbody>
</table>

Answer (B) is incorrect because the amount of $37,000 results from improperly including available-for-sale securities at cost rather than at fair value.

Answer (C) is incorrect because the amount of $28,000 results from improperly excluding available-for-sale securities from current assets.

Answer (D) is incorrect because the amount of $10,000 improperly treats only cash as working capital.

[125] (Refers to Fact Pattern #16)

Broomall’s quick (acid test) ratio at year end is

A. 2.00 to 1.
B. 1.925 to 1.
C. 1.80 to 1.
D. 1.05 to 1.

Answer (A) is incorrect because a ratio of 2.00 results from improperly including all current assets in the numerator.

Answer (B) is incorrect because a ratio of 1.925 results from improperly including available-for-sale securities in the numerator (at cost).

Answer (C) is incorrect because a ratio of 1.8 results from improperly including available-for-sale securities in the numerator.

Answer (D) is correct. The quick (acid test) ratio consists of the quick assets (cash, marketable securities, and accounts receivable) divided by current liabilities. Broomall’s quick ratio at year end is thus 1.05 [($10,000 + $12,000 + $20,000) ÷ ($15,000 + $25,000)].
Grimaldi’s net income for the year was $96,000.

Grimaldi’s acid test ratio or quick ratio at the end of the year is

A. 0.83
B. 1.02
C. 1.15
D. 1.52

- Answer (A) is incorrect because a ratio of 0.83 results from improperly including bonds payable in the denominator.
- Answer (B) is incorrect because a ratio of 1.02 results from failing to include accounts receivable in the numerator.
- Answer (C) is incorrect because a ratio of 1.15 results from failing to include marketable securities in the numerator.
- Answer (D) is correct. The acid test, or quick, ratio consists of the quick assets (cash, marketable securities, and accounts receivable) divided by current liabilities. Grimaldi’s quick ratio at year end is thus 1.516 \[\frac{($62,000 + $35,000 + $47,000)}{($84,000 + $11,000)}\].

Grimaldi’s current ratio at the end of the year is

A. 1.55
B. 1.71
C. 2.71
D. 2.97

- Answer (A) is incorrect because a ratio of 1.55 results from improperly including bonds payable in the denominator.
- Answer (B) is incorrect because a ratio of 1.71 results from failing to include both inventory and accrued liabilities in the calculation.
- Answer (C) is incorrect because a ratio of 2.71 results from improperly including deferred taxes in the denominator.
Answer (D) is correct. The current ratio, also called the working capital ratio, is the ratio of current assets to current liabilities. Grimaldi’s current assets consist of cash, marketable securities, accounts receivable, and inventory ($62,000 + $35,000 + $47,000 + $138,000 = $282,000). The company’s current liabilities consist of accounts payable and accrued liabilities ($84,000 + $11,000 = $95,000). Grimaldi’s current ratio is thus 2.968 ($282,000 ÷ $95,000).

[128] All of the following are included when calculating the acid test ratio except

A. Six-month treasury bills.
B. Prepaid insurance.
C. Accounts receivable.
D. 60-day certificates of deposit.

Answer (A) is incorrect because Six-month treasury bills are marketable securities and thus are included in the numerator of the acid test ratio.

Answer (B) is correct. The acid test (quick) ratio consists of the quick assets (cash, marketable securities, and net accounts receivable) divided by current liabilities. Prepaid insurance is an illiquid current asset and thus not appropriate to include in the numerator.

Answer (C) is incorrect because Accounts receivable are included in the numerator of the acid test ratio.

Answer (D) is incorrect because Sixty-day certificates of deposit are cash equivalents and thus are included in the numerator of the acid test ratio.

[129] A company’s cash ratio will decrease if the company

A. Purchases commercial paper.
B. Purchases materials on account.
C. Sells goods for cash at a selling price lower than cost.
D. Receives cash by issuing a short-term note payable.

Answer (A) is incorrect because The cash ratio can be expressed as cash and marketable securities divided by current liabilities. The outflow of cash to purchase the commercial paper will cause a decrease in the numerator, while the inflow of the commercial paper will cause an equal increase in the numerator. These effects will cancel each other out, leaving the ratio unchanged.

Answer (B) is correct. The cash ratio can be expressed as cash and marketable securities divided by current liabilities. If the company purchases materials on account, it will cause current liabilities to increase (the denominator of the cash ratio) while having no effect on cash or marketable securities (the numerator of the cash ratio). Because the denominator is increasing while the numerator is staying constant, the ratio will decrease.

Answer (C) is incorrect because The cash ratio can be expressed as cash and marketable securities divided by current liabilities. Selling goods for cash at a selling price lower than cost will cause an increase in the numerator as cash is increasing. This transaction would have no effect on the denominator. Therefore, the cash ratio would increase, not decrease, as the numerator is increasing while the denominator is staying the same.

Answer (D) is incorrect because The cash ratio can be expressed as cash and marketable securities divided by current liabilities. Receiving cash by issuing a short-term note payable would cause an equal increase in both the numerator and the denominator. This would cause the overall ratio to increase, not decrease.
Windham Company has current assets of $400,000 and current liabilities of $500,000. Windham Company’s current ratio will be increased by

A. The purchase of $100,000 of inventory on account.
B. The payment of $100,000 of accounts payable.
C. The collection of $100,000 of accounts receivable.
D. Refinancing a $100,000 long-term loan with short-term debt.

- Answer (A) is correct. The current ratio equals current assets divided by current liabilities. An equal increase in both the numerator and denominator of a current ratio less than 1.0 causes the ratio to increase. Windham Company’s current ratio is .8 ($400,000 ÷ $500,000). The purchase of $100,000 of inventory on account would increase the current assets to $500,000 and the current liabilities to $600,000, resulting in a new current ratio of .833.
- Answer (B) is incorrect because this transaction decreases the current ratio.
- Answer (C) is incorrect because the current ratio would be unchanged.
- Answer (D) is incorrect because this transaction decreases the current ratio.

Bond Corporation has a current ratio of 2 to 1 and a quick ratio (acid test) of 1 to 1. A transaction that would change Bond’s quick ratio but not its current ratio is the

A. Sale of inventory on account at cost.
B. Collection of accounts receivable.
C. Payment of accounts payable.
D. Purchase of a patent for cash.

- Answer (A) is correct. The quick (acid test) ratio equals the quick assets (cash, marketable securities, and accounts receivable) divided by current liabilities. The current ratio is equal to current assets divided by current liabilities. The sale of inventory (not a quick current asset) on account increases accounts receivable (a quick asset), thereby changing the quick ratio. The sale of inventory on account, however, replaces one current asset with another, and the current ratio is unaffected.
- Answer (B) is incorrect because neither ratio is changed.
- Answer (C) is incorrect because the current, not the quick, ratio changes.
- Answer (D) is incorrect because both decrease.

**Fact Pattern #18**

Tosh Enterprises reported the following account information:

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable</td>
<td>$400,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>260,000</td>
</tr>
<tr>
<td>Bonds payable, due in 10 years</td>
<td>600,000</td>
</tr>
<tr>
<td>Cash</td>
<td>200,000</td>
</tr>
<tr>
<td>Interest payable, due in 3 months</td>
<td>20,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>$800,000</td>
</tr>
<tr>
<td>Land</td>
<td>500,000</td>
</tr>
<tr>
<td>Short-term prepaid expense</td>
<td>80,000</td>
</tr>
</tbody>
</table>
What will happen to the ratios below if Tosh Enterprises uses cash to pay 25% of the accounts payable?

<table>
<thead>
<tr>
<th>Current Ratio</th>
<th>Quick Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>B. Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>C. Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. Decrease</td>
<td>Increase</td>
</tr>
</tbody>
</table>

- Answer (A) is correct. Tosh’s current ratio is 5.29 ($1,480,000 current assets ÷ $280,000 current liabilities), and its quick ratio is 2.14 ($600,000 quick assets ÷ $280,000 current liabilities). Using cash to pay 25% of the accounts payable decreases the numerator and denominator by $40,000 ($160,000 accounts payable × 25%). The new current ratio will be 6.00 ($1,440,000 ÷ $240,000), and the new quick ratio will be 2.33 ($560,000 ÷ $240,000). If a ratio exceeds 1.0, equal decreases in the numerator and denominator increase the ratio.
- Answer (B) is incorrect because Given that both ratios initially exceeded 1.0, decreasing cash and accounts payable by equal amounts will increase both ratios.
- Answer (C) is incorrect because Given that both ratios initially exceeded 1.0, decreasing cash and accounts payable by equal amounts will increase both ratios.
- Answer (D) is incorrect because Given that both ratios initially exceeded 1.0, decreasing cash and accounts payable by equal amounts will increase both ratios.

Rice, Inc., uses the allowance method to account for uncollectible accounts. An account receivable that was previously determined uncollectible and written off was collected during May. The effect of the collection on Rice’s current ratio and total working capital is

<table>
<thead>
<tr>
<th>Current Ratio</th>
<th>Working Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. None</td>
<td>None</td>
</tr>
<tr>
<td>B. Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>C. Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. None</td>
<td>Increase</td>
</tr>
</tbody>
</table>

- Answer (A) is correct. The entry to record this transaction is to debit receivables, credit the allowance, debit cash, and credit receivables. The result is to increase both an asset (cash) and a contra asset (allowance for bad debts). These appear in the current asset section of the balance sheet. Thus, the collection changes neither the current ratio nor working capital because the effects are offsetting. The credit for the journal entry is made to the allowance account on the assumption that another account will become uncollectible. The company had previously estimated its bad debts and established an appropriate allowance. It then (presumably) wrote off the wrong account. Accordingly, the journal entry reinstates a balance in the allowance account to absorb future uncollectibles.
- Answer (B) is incorrect because Neither the current ratio nor working capital is affected.
- Answer (C) is incorrect because Neither the current ratio nor working capital is affected.
- Answer (D) is incorrect because Neither the current ratio nor working capital is affected.
[Fact Pattern #19]
Depoole Company is a manufacturer of industrial products that uses a calendar year for financial reporting purposes. Assume that total quick assets exceeded total current liabilities both before and after the transaction described. Further assume that Depoole has positive profits during the year and a credit balance throughout the year in its retained earnings account.

[134] (Refers to Fact Pattern #19)
Depoole’s payment of a trade account payable of $64,500 will

A. Increase the current ratio, but the quick ratio would not be affected.
B. Increase the quick ratio, but the current ratio would not be affected.
C. Increase both the current and quick ratios.
D. Decrease both the current and quick ratios.

- Answer (A) is incorrect because The current ratio and the quick ratio will increase.
- Answer (B) is incorrect because The current ratio and the quick ratio will increase.
- Answer (C) is correct. Current assets consist of more assets than quick assets; thus, if quick assets exceed current liabilities, then current assets do also. It can also be concluded that both ratios are greater than 1. An equal reduction in the numerator and the denominator, such as a payment of a trade payable, will cause each ratio to increase.
- Answer (D) is incorrect because The current ratio and the quick ratio will increase.

[135] (Refers to Fact Pattern #19)
Depoole’s purchase of raw materials for $85,000 on open account will

A. Increase the current ratio.
B. Decrease the current ratio.
C. Increase net working capital.
D. Decrease net working capital.

- Answer (A) is incorrect because The current ratio is decreased.
- Answer (B) is correct. The purchase increases both the numerator and denominator of the current ratio by adding inventory to the numerator and payables to the denominator. Because the ratio before the purchase was greater than 1, the ratio is decreased.
- Answer (C) is incorrect because The purchase of raw materials on account has no effect on working capital (current assets and current liabilities change by the same amount).
- Answer (D) is incorrect because The purchase of raw materials on account has no effect on working capital (current assets and current liabilities change by the same amount).

[136] (Refers to Fact Pattern #19)
Depoole’s collection of a current accounts receivable of $29,000 will

A. Increase the current ratio.
B. Decrease the current ratio and the quick ratio.
C. Increase the quick ratio.
D. Not affect the current or quick ratios.
Answer (A) is incorrect because Collecting current accounts receivable does not create a net change in current assets, quick assets, or current liabilities, which means the current and quick ratios are not changed.

Answer (B) is incorrect because Collecting current accounts receivable does not create a net change in current assets, quick assets, or current liabilities, which means the current and quick ratios are not changed.

Answer (C) is incorrect because Collecting current accounts receivable does not create a net change in current assets, quick assets, or current liabilities, which means the current and quick ratios are not changed.

Answer (D) is correct. Collecting current accounts receivable has no effect on either the current ratio or the quick ratio because assets (both current and quick) are reduced for the collection of receivables and increased by the same amount for the receipt of cash. Current liabilities are unchanged by the transaction.

[137] (Refers to Fact Pattern #19)
Obsolete inventory of $125,000 was written off by Depoole during the year. This transaction

A. Decreased the quick ratio.
B. Increased the quick ratio.
C. Increased net working capital.
D. Decreased the current ratio.

Answer (A) is incorrect because The quick ratio was not affected.
Answer (B) is incorrect because The quick ratio was not affected.
Answer (C) is incorrect because Working capital was decreased.
Answer (D) is correct. Writing off obsolete inventory reduces current assets, but not quick assets (cash, marketable securities, and accounts receivable). Thus, the current ratio was reduced and the quick ratio was unaffected.

[138] (Refers to Fact Pattern #19)
Depoole’s issuance of serial bonds in exchange for an office building, with the first installment of the bonds due late this year,

A. Decreases net working capital.
B. Decreases the current ratio.
C. Decreases the quick ratio.
D. Affects all of the answers as indicated.

Answer (A) is incorrect because The bond issuance would also decrease the current ratio and the quick ratio.
Answer (B) is incorrect because The bond issuance would also decrease net working capital and the quick ratio.
Answer (C) is incorrect because The bond issuance would also decrease net working capital and the current ratio.
Answer (D) is correct. The first installment is a current liability; thus the amount of current liabilities increases with no corresponding increase in current assets. The effect is to decrease working capital, the current ratio, and the quick ratio.
Depoole’s early liquidation of a long-term note with cash affects the

A. Current ratio to a greater degree than the quick ratio.
B. Quick ratio to a greater degree than the current ratio.
C. Current and quick ratio to the same degree.
D. Current ratio but not the quick ratio.

- Answer (A) is incorrect because the quick ratio is affected to a greater degree than the current ratio.
- Answer (B) is correct. The numerators of the quick and current ratios are decreased when cash is expended. Early payment of a long-term liability has no effect on the denominator (current liabilities). Since the numerator of the quick ratio, which includes cash, net receivables, and marketable securities, is less than the numerator of the current ratio, which includes all current assets, the quick ratio is affected to a greater degree.
- Answer (C) is incorrect because the quick ratio is affected to a greater degree than the current ratio.
- Answer (D) is incorrect because the quick ratio is affected to a greater degree than the current ratio.

Peters Company has a 2-to-1 current ratio. This ratio would increase to more than 2 to 1 if

A. A previously declared stock dividend were distributed.
B. The company wrote off an uncollectible receivable.
C. The company sold merchandise on open account that earned a normal gross margin.
D. The company purchased inventory on open account.

- Answer (A) is incorrect because the distribution of a stock dividend affects only stockholders’ equity accounts (debit common stock dividend distributable and credit common stock).
- Answer (B) is incorrect because writing off an uncollectible receivable does not affect total current assets. The allowance account absorbs the bad debt. Thus, the balance of net receivables is unchanged.
- Answer (C) is correct. The current ratio equals current assets divided by current liabilities. Thus, an increase in current assets or a decrease in current liabilities, by itself, increases the current ratio. The sale of inventory at a profit increases current assets without changing liabilities. Inventory decreases, and receivables increase by a greater amount. Thus, total current assets and the current ratio increase.
- Answer (D) is incorrect because the purchase of inventory increases current assets and current liabilities by the same amount. The transaction reduces a current ratio in excess of 1.0 since the numerator and denominator of the ratio increase by the same amount.

Merit, Inc., uses the direct write-off method to account for uncollectible accounts receivable. If the company subsequently collects an account receivable that was written off in a prior accounting period, the effect of the collection of the account receivable on Merit’s current ratio and total working capital would be

<table>
<thead>
<tr>
<th>Current Ratio</th>
<th>Working Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. None</td>
<td>None</td>
</tr>
<tr>
<td>B. Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>C. Increase</td>
<td>None</td>
</tr>
<tr>
<td>D. None</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because the current ratio and working capital increase.
Answer (B) is correct. Because the company uses the direct write-off method, the original entry involved a debit to a bad debt expense account (closed to retained earnings). The subsequent collection required a debit to cash and a credit to bad debt expense or retained earnings. Thus, only one current asset account was involved in the collection entry, and current assets (cash) increased as a result. If current assets increase and no change occurs in current liabilities, the current ratio and working capital both increase.

Answer (C) is incorrect because the current ratio and working capital increase.

Answer (D) is incorrect because the current ratio and working capital increase.

[Fact Pattern #20]
Excerpts from the statement of financial position for Landau Corporation as of September 30 of the current year are presented as follows.

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$950,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>$1,675,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>$2,806,000</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$5,431,000</strong></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$1,004,000</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>$785,000</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$1,789,000</strong></td>
</tr>
</tbody>
</table>

The board of directors of Landau Corporation met on October 4 of the current year and declared the regular quarterly cash dividend amounting to $750,000 ($0.60 per share). The dividend is payable on October 25 of the current year to all shareholders of record as of October 12 of the current year. Assume that the only transactions to affect Landau Corporation during October of the current year are the dividend transactions and that the closing entries have been made.

[142] (Refers to Fact Pattern #20)
Landau Corporation’s working capital was

A. Unchanged by the dividend declaration and decreased by the dividend payment.
B. Decreased by the dividend declaration and increased by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Decreased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is incorrect because the declaration of a cash dividend reduces working capital and the dividend payment has no effect on working capital.
- Answer (B) is incorrect because the subsequent payment of a previously declared dividend has no effect on working capital.
- Answer (C) is incorrect because the declaration of a cash dividend reduces working capital.
- Answer (D) is correct. Working capital is the excess of current assets over current liabilities. The declaration of a dividend requires a debit to retained earnings and a credit to dividends payable (a current liability). Thus, working capital is decreased by the amount of the increased current liability. The subsequent payment of the dividend has no effect on working capital because current assets (cash) and current liabilities (dividends payable) are both decreased by the same amount.
[143] (Refers to Fact Pattern #20)

Landau Corporation’s current ratio was

A. Decreased by the dividend declaration and increased by the dividend payment.
B. Unchanged by either the dividend declaration or the dividend payment.
C. Decreased by the dividend declaration and unchanged by the dividend payment.
D. Increased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is correct. The dividend declaration decreased retained earnings and increased current liabilities by $750,000. The subsequent payment decreased both current assets and current liabilities by $750,000. Before the dividend declaration, the current ratio was 3.03 (5,431,000 ÷ $1,789,000). The declaration increased current liabilities to $2,539,000, and the new current ratio was 2.14 ($5,431,000 ÷ $2,539,000). The payment reduced current assets to $4,681,000 and current liabilities to $1,789,000. Thus, after the payment, the current ratio was 2.61 ($4,681,000 ÷ $1,789,000).
- Answer (B) is incorrect because a dividend declaration reduces the current ratio.
- Answer (C) is incorrect because payment of the dividend increased the ratio. Reducing the numerator and denominator by equal amounts always increases a ratio that is greater than 1.0.
- Answer (D) is incorrect because the current ratio is reduced, not increased, by a dividend declaration.

[Fact Pattern #21]

Excerpts from the statement of financial position for Markham Corporation as of April 30 of the current year are presented as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 725,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>1,640,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>2,945,000</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$5,310,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$1,236,000</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>831,000</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$2,067,000</td>
</tr>
</tbody>
</table>

The board of directors of Markham met on May 5 of the current year and declared a quarterly cash dividend in the amount of $800,000 ($0.50 per share). The dividend was paid on May 28 of the current year to shareholders of record as of May 15 of the current year. Assume that the only transactions that affected Markham during May of the current year were the dividend transactions and that the closing entries have been made.

[144] (Refers to Fact Pattern #21)

Markham’s working capital would be

A. Decreased by the dividend declaration and increased by the dividend payment.
B. Unchanged by either the dividend declaration or the dividend payment.
C. Decreased by the dividend declaration and unchanged by the dividend payment.
D. Increased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is incorrect because the dividend payment will not change working capital, but the declaration of the dividend decreases working capital.
Answer (B) is incorrect because the dividend payment will not change working capital, but the declaration of the dividend decreases working capital.

Answer (C) is correct. Working capital is the excess of current assets over current liabilities. The declaration of a dividend reduces retained earnings and creates a new current liability. Thus, the declaration of a dividend reduces working capital because current liabilities are increased without a corresponding increase in current assets. The subsequent payment of the dividend has no effect on working capital because current assets (cash) will be reduced by the same amount that current liabilities (dividends payable) are reduced.

Answer (D) is incorrect because the dividend payment will not change working capital, but the declaration of the dividend decreases working capital.

[145] (Refers to Fact Pattern #21)

Markham’s current ratio would be

A. Decreased by the dividend declaration and increased by the dividend payment.
B. Increased by the dividend declaration and unchanged by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Unchanged by the dividend declaration and decreased by the dividend payment.

Answer (A) is correct. The current ratio equals current assets divided by current liabilities. The declaration of a dividend results in a decrease in retained earnings and an increase in current liabilities. The effect is to decrease the current ratio because current liabilities are increased at the time of the declaration without a change in current assets. The April 30 current ratio is 2.57 ($5,310,000 ÷ $2,067,000). Following the declaration of an $800,000 dividend, the current ratio is 1.85 ($5,310,000 ÷ $2,867,000). The subsequent payment of the dividend will increase the ratio because the ratio is greater than 1.0 and both current assets and current liabilities will decline by the same amount. The current ratio after the payment is 2.18 ($4,510,000 ÷ $2,067,000).

Answer (B) is incorrect because the dividend declaration decreases the current ratio, and the payment increases the ratio.

Answer (C) is incorrect because the dividend declaration decreases the current ratio, and the payment increases the ratio.

Answer (D) is incorrect because the dividend declaration decreases the current ratio, and the payment increases the ratio.

[146] The following transactions occurred during a company’s first year of operations:

I. Purchased a delivery van for cash
II. Borrowed money by issuance of short-term debt
III. Purchased treasury stock

Which of the items above caused a change in the amount of working capital?

A. I only.
B. I and II only.
C. II and III only.
D. I and III only.

Answer (A) is incorrect because the purchases of the van and treasury stock affect working capital.

Answer (B) is incorrect because the purchases of the van and treasury stock but not the issuance of short-term debt affect working capital.

Answer (C) is incorrect because the purchases of the van and treasury stock but not the issuance of short-term debt affect working capital.
Answer (D) is correct. Working capital is computed by deducting total current liabilities from total current assets. The purchase of a delivery van for cash reduces current assets and has no effect on current liabilities. The borrowing of cash by incurring short-term debt increases current assets by the same amount as it increases current liabilities; hence, it will have no effect on working capital. The purchase of treasury stock decreases current assets but has no effect on current liabilities. Thus, the purchases of the van and treasury stock affect working capital.

[Fact Pattern #22]

CPZ Enterprises had the following account information.

<table>
<thead>
<tr>
<th>Account Information</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable</td>
<td>$200,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>80,000</td>
</tr>
<tr>
<td>Bonds payable, due in 10 years</td>
<td>300,000</td>
</tr>
<tr>
<td>Cash</td>
<td>100,000</td>
</tr>
<tr>
<td>Interest payable, due in 3 months</td>
<td>10,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>400,000</td>
</tr>
<tr>
<td>Land</td>
<td>250,000</td>
</tr>
<tr>
<td>Notes payable, due in 6 months</td>
<td>50,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>40,000</td>
</tr>
</tbody>
</table>

The company has an operating cycle of 5 months.

[147] (Refers to Fact Pattern #22)

What will happen to the ratios below if CPZ Enterprises uses cash to pay 50% of the accounts payable?

<table>
<thead>
<tr>
<th>Current Ratio</th>
<th>Quick Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>B. Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>C. Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. Decrease</td>
<td>Increase</td>
</tr>
</tbody>
</table>

Answer (A) is correct. Using cash to pay accounts payable will affect both ratios in a positive way. For instance, before the payment, current assets totaled $740,000 and current liabilities were $140,000, yielding a current ratio of 5.29. Paying $40,000 of the accounts payable ($80,000 × 50%) would reduce current assets to $700,000 and current liabilities to $100,000, for a new current ratio of 7.67. The quick assets would decline from $300,000 to $260,000, and the current liabilities from $140,000 to $100,000, for a new quick ratio of 2.78, an increase over the old ratio of 2.14.

Answer (B) is incorrect because Both ratios will increase as a result of using cash to pay 50% of the accounts payable.

Answer (C) is incorrect because Both ratios will increase as a result of using cash to pay 50% of the accounts payable.

Answer (D) is incorrect because Both ratios will increase as a result of using cash to pay 50% of the accounts payable.
[Fact Pattern #23]

Jensen Corporation’s board of directors met on June 3 and declared a regular quarterly cash dividend of $.40 per share for a total value of $200,000. The dividend is payable on June 24 to all stockholders of record as of June 17. Excerpts from the statement of financial position for Jensen Corporation as of May 31 are presented as follows.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$400,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>800,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>1,200,000</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$2,400,000</strong></td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$1,000,000</strong></td>
</tr>
</tbody>
</table>

Assume that the only transactions to affect Jensen Corporation during June are the dividend transactions.

[148] (Refers to Fact Pattern #23)

Jensen’s working capital would be

A. Unchanged by the dividend declaration and decreased by the dividend payment.
B. Decreased by the dividend declaration and increased by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Decreased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is incorrect because the declaration of a dividend increases current liabilities and reduces working capital. The subsequent payment has no effect on working capital.
- Answer (B) is incorrect because the declaration of a dividend increases current liabilities and reduces working capital. The subsequent payment has no effect on working capital.
- Answer (C) is incorrect because the declaration of a dividend increases current liabilities and reduces working capital. The subsequent payment has no effect on working capital.
- Answer (D) is correct. Working capital is defined as current assets minus current liabilities. The declaration of a dividend increases current liabilities and thus reduces working capital. The subsequent payment has no effect on working capital since current assets and current liabilities decrease by the same amount.

[149] (Refers to Fact Pattern #23)

Jensen’s current ratio would be

A. Unchanged by the dividend declaration and decreased by the dividend payment.
B. Decreased by the dividend declaration and increased by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Decreased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is incorrect because the dividend declaration increases liabilities and decreases the current ratio. The subsequent payment decreases both current assets and current liabilities by the same amount, thereby increasing a current ratio in excess of one.
- Answer (B) is correct. The current ratio is computed by dividing current assets by current liabilities. The declaration of a dividend increases liabilities (to $1,200,000) and thus decreases the ratio. After the declaration, the ratio is 2.0 ($2,400,000 ÷ 1,200,000). It was originally 2.4 ($2,400,000 ÷ 1,000,000). The subsequent payment decreases both current assets and current liabilities by $200,000. The ratio is then 2.2 ($2,200,000 ÷ 1,000,000). Therefore, the payment of the current liability increases the current ratio.
• Answer (C) is incorrect because the dividend declaration increases liabilities and decreases the current ratio. The subsequent payment decreases both current assets and current liabilities by the same amount, thereby increasing a current ratio in excess of one.

• Answer (D) is incorrect because the dividend declaration increases liabilities and decreases the current ratio. The subsequent payment decreases both current assets and current liabilities by the same amount, thereby increasing a current ratio in excess of one.

[150] (Refers to Fact Pattern #23)

Jensen’s quick (acid test) ratio would be

A. Unchanged by the dividend declaration and decreased by the dividend payment.
B. Decreased by the dividend declaration and increased by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Decreased by the dividend declaration and unchanged by the dividend payment.

• Answer (A) is incorrect because the dividend declaration increases current liabilities and decreases the quick ratio. The subsequent payment of a cash dividend decreases quick assets and current liabilities by the same amount. Accordingly, the ratio (1.0) remains unchanged by the payment.

• Answer (B) is incorrect because the dividend declaration increases current liabilities and decreases the quick ratio. The subsequent payment of a cash dividend decreases quick assets and current liabilities by the same amount. Accordingly, the ratio (1.0) remains unchanged by the payment.

• Answer (C) is incorrect because the dividend declaration increases current liabilities and decreases the quick ratio. The subsequent payment of a cash dividend decreases quick assets and current liabilities by the same amount. Accordingly, the ratio (1.0) remains unchanged by the payment.

• Answer (D) is correct. The quick ratio is computed by dividing quick assets (cash, marketable securities, and receivables) by current liabilities. The dividend declaration will increase current liabilities to $1,200,000 and decrease the quick ratio to 1.0 ($1,200,000 quick assets ÷ $1,200,000 current liabilities). The payment of a cash dividend will decrease quick assets (cash) and the current liabilities by the same amount. Accordingly, the ratio (1.0) remains unchanged by the payment.

[151] All of the following are affected when merchandise is purchased on credit except

A. Total current assets.
B. Net working capital.
C. Total current liabilities.
D. Current ratio.

• Answer (A) is incorrect because current assets are increased by the amount of inventory purchased.

• Answer (B) is correct. Working capital is the net of current assets and current liabilities. When merchandise is purchased on credit, inventory (a current asset) is increased, and accounts payable (a current liability) is increased by the same amount. Thus, no net change in working capital results.

• Answer (C) is incorrect because current liabilities are increased by the amount of the credit purchase.

• Answer (D) is incorrect because the numerator (current assets) and the denominator (current liabilities) of the current ratio are increased by the same amount.
Birch Products, Inc., has the following current assets:

<table>
<thead>
<tr>
<th>Asset</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$250,000</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>$100,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>$800,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>$1,450,000</td>
</tr>
</tbody>
</table>

If Birch’s current liabilities are $1,300,000, the firm’s

A. Current ratio will decrease if a payment of $100,000 cash is used to pay $100,000 of accounts payable.
B. Current ratio will not change if a payment of $100,000 cash is used to pay $100,000 of accounts payable.
C. Quick ratio will decrease if a payment of $100,000 cash is used to purchase inventory.
D. Quick ratio will not change if a payment of $100,000 cash is used to purchase inventory.

- Answer (A) is incorrect because The numerator of the current ratio is twice the denominator. For this reason, the same dollar-amount reduction in each produces a greater percentage reduction in the denominator, driving the ratio up.
- Answer (B) is incorrect because The numerator of the current ratio is twice the denominator. For this reason, the same dollar-amount reduction in each produces a greater percentage reduction in the denominator, driving the ratio up.
- Answer (C) is correct. The only difference between the current ratio and the quick ratio is the removal of inventories from the numerator of the quick ratio. Thus, a shift from cash to inventory will have a reducing effect on the quick ratio that it does not have on the current ratio.
- Answer (D) is incorrect because The quick ratio, unlike the current ratio, will be reduced if cash is used to pay for inventory.

Davis Retail, Inc., has total assets of $7,500,000 and a current ratio of 2.3 times before purchasing $750,000 of merchandise on credit for resale. After this purchase, the current ratio will

A. Remain at 2.3 times.
B. Be higher than 2.3 times.
C. Be lower than 2.3 times.
D. Be exactly 2.53 times.

- Answer (A) is incorrect because The current ratio is the ratio of current assets to current liabilities. When the ratio is greater than one, any change of equal dollar amount on both the numerator and denominator will result in a lowering of the overall ratio (since the denominator will increase by a proportionally greater amount). The purchase of merchandise on credit is an example of such a change: inventory increases in the numerator and accounts payable increase in the denominator by an equal dollar amount.
- Answer (B) is incorrect because The current ratio is the ratio of current assets to current liabilities. When the ratio is greater than one, any change of equal dollar amount on both the numerator and denominator will result in a lowering of the overall ratio (since the denominator will increase by a proportionally greater amount). The purchase of merchandise on credit is an example of such a change: inventory increases in the numerator and accounts payable increase in the denominator by an equal dollar amount.
- Answer (C) is correct. The current ratio is the ratio of current assets to current liabilities. When the ratio is greater than one, any change of equal dollar amount on both the numerator and denominator will result in a lowering of the overall ratio (since the denominator will increase by a proportionally greater amount). The purchase of merchandise on credit is an example of such a change: inventory increases in the numerator and accounts payable increase in the denominator by an equal dollar amount.
Answer (D) is incorrect because The current ratio is the ratio of current assets to current liabilities. When the ratio is greater than one, any change of equal dollar amount on both the numerator and denominator will result in a lowering of the overall ratio (since the denominator will increase by a proportionally greater amount). The purchase of merchandise on credit is an example of such a change: inventory increases in the numerator and accounts payable increase in the denominator by an equal dollar amount.

Markowitz Company increased its allowance for uncollectible accounts. This adjustment will

A. Increase the acid test ratio.
B. Increase working capital.
C. Reduce debt-to-asset ratio.
D. Reduce the current ratio.

Answer (A) is incorrect because By reducing net receivables, an increase in the allowance for uncollectible accounts lowers the acid test (quick) ratio.

Answer (B) is incorrect because By reducing net receivables, an increase in the allowance for uncollectible accounts lowers the level of working capital.

Answer (C) is incorrect because By reducing net receivables, an increase in the allowance for uncollectible accounts lowers total assets, raising the debt-to-asset ratio.

Answer (D) is correct. The current ratio is the ratio of current assets to current liabilities. By reducing net receivables, an increase in the allowance for uncollectible accounts lowers the amount of current assets (the numerator), reducing the overall ratio.

Garstka Auto Parts must increase its acid test ratio above the current 0.9 level in order to comply with the terms of a loan agreement. Which one of the following actions is most likely to produce the desired results?

A. Expediting collection of accounts receivable.
B. Selling auto parts on account.
C. Making a payment to trade accounts payable.
D. Purchasing marketable securities for cash.

Answer (A) is incorrect because Converting accounts receivable into cash has no net effect on the numerator of the acid test ratio.

Answer (B) is correct. The acid test (quick) ratio consists of the quick assets (cash, marketable securities, and net accounts receivable) divided by current liabilities. Exchanging merchandise inventory for accounts receivable increases the numerator while having no effect on the denominator, resulting in an increase in the overall ratio.

Answer (C) is incorrect because Paying down accounts payable decreases both the numerator and denominator by the same dollar amount, resulting in a decrease of the acid test ratio.

Answer (D) is incorrect because Purchasing marketable securities for cash has no net effect on the numerator.

The owner of a chain of grocery stores has bought a large supply of mangoes and paid for the fruit with cash. This purchase will adversely impact which one of the following?

A. Working capital.
B. Current ratio.
C. Quick or acid test ratio.
D. Price earnings ratio.
• Answer (A) is incorrect because one current asset is exchanged for another, leaving working capital unchanged.
• Answer (B) is incorrect because the current ratio is current assets divided by current liabilities; exchanging one current asset for another leaves the numerator unchanged.
• Answer (C) is correct. The quick (acid test) ratio consists of the quick assets (cash, marketable securities, and net accounts receivable) divided by current liabilities. Buying merchandise inventory with cash reduces the numerator, lowering the overall ratio.
• Answer (D) is incorrect because the price earnings ratio does not pertain to balance sheet accounts.

Both the current ratio and the quick ratio for Spartan Corporation have been slowly decreasing. For the past two years, the current ratio has been 2.3-to-1 and 2.0-to-1. During the same time period, the quick ratio has decreased from 1.2-to-1 to 1.0-to-1. The disparity between the current and quick ratios can be explained by which one of the following?

A. The current portion of long-term debt has been steadily increasing.
B. The cash balance is unusually low.
C. The accounts receivable balance has decreased.
D. The inventory balance is unusually high.

• Answer (A) is incorrect because the only difference between the current ratio and the quick ratio is the removal of inventories from the numerator of the quick ratio; a change in current liabilities (the denominator) cannot account for the discrepancy.
• Answer (B) is incorrect because the only difference between the current ratio and the quick ratio is the removal of inventories from the numerator of the quick ratio; a change in cash cannot account for the discrepancy.
• Answer (C) is incorrect because the only difference between the current ratio and the quick ratio is the removal of inventories from the numerator of the quick ratio; a change in accounts receivable cannot account for the discrepancy.
• Answer (D) is correct. The only difference between the current ratio and the quick ratio is the removal of inventories from the numerator of the quick ratio. Thus, a high inventory balance can account for the disparity between the current and quick ratios.

The acid test ratio shows the ability of a company to pay its current liabilities without having to

A. Reduce its cash balance.
B. Borrow additional funds.
C. Collect its receivables.
D. Liquidate its inventory.

• Answer (A) is incorrect because reducing cash is the normal way of paying current liabilities.
• Answer (B) is incorrect because the acid test measures the liquidity of assets on hand, not the ability to borrow funds.
• Answer (C) is incorrect because accounts receivable are in the numerator of the acid test ratio; the ability to collect them is crucial.
• Answer (D) is correct. The acid test (quick) ratio consists of the quick assets (cash, marketable securities, and net accounts receivable) divided by current liabilities. Thus, the numerator consists of those assets that are more liquid than inventory.
When a fixed asset is sold for less than book value, which one of the following will decrease?

A. Total current assets.
B. Current ratio.
C. Net profit.
D. Net working capital.

- Answer (A) is incorrect because Cash will be received, raising current assets.
- Answer (B) is incorrect because Cash will be received and current liabilities will remain unchanged, raising the current ratio.
- Answer (C) is correct. When an asset is sold for less than book value, an accrual-basis loss is incurred. This reduces net profit.
- Answer (D) is incorrect because Cash will be received and current liabilities will remain unchanged, raising net working capital.

If a company has a current ratio of 2.1 and pays off a portion of its accounts payable with cash, the current ratio will

A. Decrease.
B. Increase.
C. Remain unchanged.
D. Move closer to the quick ratio.

- Answer (A) is incorrect because Since the numerator before the transaction was greater than the denominator, a reduction to both factors of an equal dollar amount will have a proportionally greater effect on the denominator, causing the ratio as a whole to increase.
- Answer (B) is correct. The current ratio is the ratio of current assets to current liabilities. Since the numerator before the transaction was greater than the denominator, a reduction to both factors of an equal dollar amount will have a proportionally greater effect on the denominator, causing the ratio as a whole to increase.
- Answer (C) is incorrect because Since the numerator before the transaction was greater than the denominator, a reduction to both factors of an equal dollar amount will have a proportionally greater effect on the denominator, causing the ratio as a whole to increase.
- Answer (D) is incorrect because Since the numerator before the transaction was greater than the denominator, a reduction to both factors of an equal dollar amount will have a proportionally greater effect on the denominator, causing the ratio as a whole to increase.

When a balance sheet amount is related to an income statement amount in computing a ratio,

A. The balance sheet amount should be converted to an average for the year.
B. The income statement amount should be converted to an average for the year.
C. Both amounts should be converted to market value.
D. Comparisons with industry ratios are not meaningful.

- Answer (A) is correct. In ratios that relate the income statement to the balance sheet (e.g., inventory turnover, asset turnover, receivables turnover, and return on assets), the balance sheet figure should be an average. The reason is that the income statement amounts represent activity over a period of time. Thus, the balance sheet figure should be adjusted to reflect assets available for use throughout the period.
- Answer (B) is incorrect because The income statement amount is a single figure for an entire year; there is nothing to average.
Answer (C) is incorrect because Traditional financial statements and the ratios computed from the data they present are mostly stated in historical cost terms.

Answer (D) is incorrect because Comparison is the purpose of ratio usage. All ratios are meaningless unless compared to something else, such as an industry average.

[162] Accounts receivable turnover ratio will normally decrease as a result of

A. The write-off of an uncollectible account (assume the use of the allowance for doubtful accounts method).
B. A significant sales volume decrease near the end of the accounting period.
C. An increase in cash sales in proportion to credit sales.
D. A change in credit policy to lengthen the period for cash discounts.

Answer (A) is incorrect because Write-offs do not reduce net receivables (gross receivables – the allowance) and will not affect the receivables balance and therefore the turnover ratio if an allowance system is used.

Answer (B) is incorrect because A decline in sales near the end of the period signifies fewer credit sales and receivables, and the effect of reducing the numerator and denominator by equal amounts is to increase the ratio if the fraction is greater than 1.0.

Answer (C) is incorrect because An increase in cash sales with no diminution of credit sales will not affect receivables.

Answer (D) is correct. The accounts receivable turnover ratio equals net credit sales divided by average receivables. Hence, it will decrease if a company lengthens the credit period or the discount period because the denominator will increase as receivables are held for longer times.

[163] Which one of the following inventory cost flow assumptions will result in a higher inventory turnover ratio in an inflationary economy?

A. FIFO.
B. LIFO.
C. Weighted average.
D. Specific identification.

Answer (A) is incorrect because When prices are rising, LIFO results in a higher cost of goods sold and a lower average inventory than under other inventory cost flow assumptions.

Answer (B) is correct. The inventory turnover ratio equals the cost of goods sold divided by the average inventory. LIFO assumes that the last goods purchased are the first goods sold and that the oldest goods purchased remain in inventory. The result is a higher cost of goods sold and a lower average inventory than under other inventory cost flow assumptions if prices are rising. Because cost of goods sold (the numerator) will be higher and average inventory (the denominator) will be lower than under other inventory cost flow assumptions, LIFO produces the highest inventory turnover ratio.

Answer (C) is incorrect because When prices are rising, LIFO results in a higher cost of goods sold and a lower average inventory than under other inventory cost flow assumptions.

Answer (D) is incorrect because When prices are rising, LIFO results in a higher cost of goods sold and a lower average inventory than under other inventory cost flow assumptions.
The days’ sales in receivables ratio will be understated if the company

A. Uses a natural business year for its accounting period.
B. Uses a calendar year for its accounting period.
C. Uses average receivables in the ratio calculation.
D. Does not use average receivables in the ratio calculation.

- Answer (A) is correct. The days’ sales in receivables ratio equals the days in the year divided by the receivables turnover ratio (sales ÷ average receivables). Days’ sales may also be computed based only on ending receivables. In either case, use of the natural business year tends to understate the ratio because receivables will usually be at a low point at the beginning and end of the natural year. For example, a ski resort may close its books on May 31, a low point in its operating cycle.
- Answer (B) is incorrect because Using a calendar year will not necessarily affect the usefulness of the days’ sales ratio.
- Answer (C) is incorrect because Using average receivables would not always understate the ratio. The ratio could be higher or lower depending on changes in sales volume or the percentage of credit to cash sales, or other factors.
- Answer (D) is incorrect because The ratio could be higher or lower depending on changes in sales volume or the percentage of credit to cash sales, or other factors.
**Statement of Financial Position as of May 31**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$45</td>
<td>$38</td>
</tr>
<tr>
<td>Trading securities</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>68</td>
<td>48</td>
</tr>
<tr>
<td>Inventory</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$255</td>
<td>$216</td>
</tr>
<tr>
<td>Investments, at equity</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>Property, plant, and equipment (net)</td>
<td>375</td>
<td>400</td>
</tr>
<tr>
<td>Intangible assets (net)</td>
<td>80</td>
<td>45</td>
</tr>
<tr>
<td>Total assets</td>
<td>$748</td>
<td>$691</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes payable</td>
<td>$35</td>
<td>$18</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>70</td>
<td>42</td>
</tr>
<tr>
<td>Accrued expenses</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Income taxes payable</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$125</td>
<td>$80</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Deferred taxes</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$163</td>
<td>$117</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred stock, 6%, $100 par value, cumulative</td>
<td>$150</td>
<td>$150</td>
</tr>
<tr>
<td>Common stock, $10 par value</td>
<td>225</td>
<td>195</td>
</tr>
<tr>
<td>Additional paid-in capital -- common stock</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>96</td>
<td>129</td>
</tr>
<tr>
<td>Total equity</td>
<td>$585</td>
<td>$574</td>
</tr>
<tr>
<td>Total liabilities and equity</td>
<td>$748</td>
<td>$691</td>
</tr>
</tbody>
</table>

**Income Statement for the year ended May 31**

<table>
<thead>
<tr>
<th>(in thousands)</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$480</td>
<td>$460</td>
</tr>
<tr>
<td>Costs and expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs of goods sold</td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td>Selling, general, and administrative</td>
<td>52</td>
<td>51</td>
</tr>
<tr>
<td>Interest expense</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Income before taxes</td>
<td>$90</td>
<td>$85</td>
</tr>
<tr>
<td>Income taxes</td>
<td>36</td>
<td>34</td>
</tr>
<tr>
<td>Net income</td>
<td>$54</td>
<td>$51</td>
</tr>
</tbody>
</table>

[165] (Refers to Fact Pattern #24)

Devlin Company’s inventory turnover for the year ended May 31, Year 2, was

A. 3.67 times.
B. 3.88 times.
C. 5.33 times.
D. 5.65 times.

- Answer (A) is incorrect because the figure of 3.67 is based on ending inventory.
Answer (B) is correct. Inventory turnover equals cost of goods sold divided by average inventory. Hence, the inventory turnover is 3.88 times per year ($330 COGS ÷ (($90 + $80) ÷ 2))

Answer (C) is incorrect because the figure of 5.33 equals sales divided by ending inventory.

Answer (D) is incorrect because the figure of 5.65 is based on sales, not cost of goods sold.

[166] (Refers to Fact Pattern #24)
Devlin Company’s asset turnover for the year ended May 31, Year 2, was

A. 0.08 times.
B. 0.46 times.
C. 0.67 times.
D. 0.83 times.

Answer (A) is incorrect because the figure of 0.08 is based on net income.

Answer (B) is incorrect because the figure of 0.46 uses cost of goods sold in the numerator.

Answer (C) is correct. Asset turnover equals net sales divided by average total assets. Consequently, the asset turnover is 0.67 times per year ($480 net sales ÷ (($748 + $691) ÷ 2)).

Answer (D) is incorrect because the figure of 0.83 is based on average total shareholders’ equity.

[167] The number of days’ sales in receivables is a measure of

A. Asset value.
B. Sales performance.
C. Profitability.
D. Liquidity.

Answer (A) is incorrect because Valuation is not measured.

Answer (B) is incorrect because Sales performance is measured by profitability ratios.

Answer (C) is incorrect because Profitability ratios measure a firm’s return on its investment. An example is earnings per share.

Answer (D) is correct. Turnover ratios are activity ratios that measure management’s efficiency in using assets. However, the number of days’ sales in receivables (days in the year divided by the receivables turnover ratio), also known as the average collection period, and other turnover ratios are a measure of liquidity because these statistics show how long it will take to turn inventory into cash.

[168] A change in credit policy has caused an increase in sales, an increase in discounts taken, a reduction in the investment in accounts receivable, and a reduction in the number of doubtful accounts. Based upon this information, we know that

A. Net profit has increased.
B. The average collection period has decreased.
C. Gross profit has declined.
D. The size of the discount offered has decreased.

Answer (A) is incorrect because No statement can be made with respect to profits without knowing costs.
● Answer (B) is correct. An increase in discounts taken accompanied by declines in receivables balances and doubtful accounts all indicate that collections on the increased sales have been accelerated. Accordingly, the average collection period must have declined. The average collection period is a ratio calculated by dividing the number of days in a year (365) by the receivable turnover. Thus, the higher the turnover, the shorter the average collection period. The turnover increases when either sales (the numerator) increase, or receivables (the denominator) decrease. Accomplishing both higher sales and a lower receivables increases the turnover and results in a shorter collection period.

● Answer (C) is incorrect because No statement can be made with respect to profits without knowing costs.

● Answer (D) is incorrect because The discount may have been increased, which has led to quicker payments.

[Fact Pattern #25]
The Statement of Financial Position for King Products Corporation for the fiscal years ended June 30, Year 2, and June 30, Year 1, is presented below. Net sales and cost of goods sold for the year ended June 30, Year 2, were $600,000 and $440,000, respectively.

King Products Corporation
Statement of Financial Position
(in thousands)

<table>
<thead>
<tr>
<th>June 30</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 60</td>
<td>$ 50</td>
</tr>
<tr>
<td>Marketable securities (at market)</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>90</td>
<td>60</td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>120</td>
<td>100</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$340</td>
<td>$280</td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>$200</td>
<td>$190</td>
</tr>
<tr>
<td>Building (net)</td>
<td>160</td>
<td>180</td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>190</td>
<td>200</td>
</tr>
<tr>
<td>Patents (net)</td>
<td>70</td>
<td>34</td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>40</td>
<td>26</td>
</tr>
<tr>
<td>Total long-term assets</td>
<td>$660</td>
<td>$630</td>
</tr>
<tr>
<td>Total assets</td>
<td>$1,000</td>
<td>$910</td>
</tr>
<tr>
<td>Notes payable</td>
<td>$46</td>
<td>$24</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>94</td>
<td>56</td>
</tr>
<tr>
<td>Accrued interest</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$170</td>
<td>$110</td>
</tr>
<tr>
<td>Notes payable, 10% due 12/31/Year 7</td>
<td>$20</td>
<td>$20</td>
</tr>
<tr>
<td>Bonds payable, 12% due 6/30/Year 10</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total long-term debt</td>
<td>$50</td>
<td>$50</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$220</td>
<td>$160</td>
</tr>
<tr>
<td>Preferred stock -- 5% cumulative, $100 par, nonparticipating, authorized, issued and outstanding, 2,000 shares</td>
<td>$200</td>
<td>$200</td>
</tr>
<tr>
<td>Common stock -- $10 par, 40,000 shares authorized, 30,000 shares issued and outstanding</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Additional paid-in capital -- common</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Total equity</td>
<td>$780</td>
<td>$750</td>
</tr>
<tr>
<td>Total liabilities &amp; equity</td>
<td>$1,000</td>
<td>$910</td>
</tr>
</tbody>
</table>
[169] (Refers to Fact Pattern #25)
King Products Corporation’s inventory turnover ratio for the fiscal year ended at June 30, Year 2, was

A. 3.7  
B. 4.0  
C. 4.4  
D. 6.0  

- Answer (A) is incorrect because this figure is based on year-end inventory.  
- Answer (B) is **correct**. The inventory turnover ratio equals cost of sales divided by the average inventory. Consequently, the inventory turnover is 4 times per year \( \frac{440,000}{\left(\frac{120,000 + 100,000}{2}\right)} \).  
- Answer (C) is incorrect because this figure is based on beginning inventory.  
- Answer (D) is incorrect because this figure is based on sales and beginning inventory.  

[170] (Refers to Fact Pattern #25)
King Products Corporation’s receivables turnover ratio for this period was

A. 4.9  
B. 5.9  
C. 6.7  
D. 8.0  

- Answer (A) is incorrect because this figure is based on cost of sales and year-end receivables.  
- Answer (B) is incorrect because this figure is based on cost of sales.  
- Answer (C) is incorrect because this figure is based on year-end receivables.  
- Answer (D) is **correct**. The receivables turnover ratio equals net credit sales divided by the average receivables balance. In this question, net sales must be used because the amount of net credit sales is not given. Thus, the receivables turnover is 8 times per year \( \frac{600,000}{\left(\frac{90,000 + 60,000}{2}\right)} \).  

[171] (Refers to Fact Pattern #25)
King Products Corporation’s average collection period for the fiscal year ended June 30, Year 2, using a 360-day year was

A. 36 days.  
B. 45 days.  
C. 54 days.  
D. 61 days.  

- Answer (A) is incorrect because this figure assumes a turnover of 10 times per year.  
- Answer (B) is **correct**. The average collection period equals the number of days in a year divided by the receivables turnover ratio. The receivables turnover was 8 times per year \( \frac{600,000}{\left(\frac{90,000 + 60,000}{2}\right)} \). Thus, the average collection period is 45 days \( \frac{360}{8} \).  
- Answer (C) is incorrect because this figure assumes a turnover of 6.7 times per year.  
- Answer (D) is incorrect because this figure assumes a turnover of 5.9 times per year.
Based on the data presented below, what is Beta Corporation’s cost of sales for the year?

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current ratio</td>
<td>3.5</td>
</tr>
<tr>
<td>Acid test ratio</td>
<td>3.0</td>
</tr>
<tr>
<td>Year-end current liabilities</td>
<td>$600,000</td>
</tr>
<tr>
<td>Beginning inventory</td>
<td>$500,000</td>
</tr>
<tr>
<td>Inventory turnover</td>
<td>8.0</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Doubling, rather than averaging, beginning and ending inventory results in $1,600,000.
- Answer (B) is incorrect because Using ending, rather than average, inventory results in $2,400,000.
- Answer (C) is correct. The current ratio is the ratio of current assets to current liabilities. Since the current ratio and current liabilities are known, current assets can be determined as follows:

  \[
  \text{Current assets} \div \text{Current liabilities} = \text{Current ratio}
  \]

  \[
  \text{Current assets} \div \$600,000 = 3.5
  \]

  \[
  \text{Current assets} = \$600,000 \times 3.5
  \]

  \[
  = \$2,100,000
  \]

Quick assets can be determined similarly:

\[
\text{Quick assets} \div \text{Current liabilities} = \text{Acid test ratio}
\]

\[
\text{Quick assets} \div \$600,000 = 3.0
\]

\[
\text{Quick assets} = \$600,000 \times 3.0
\]

\[
= \$1,800,000
\]

Assuming the company had no prepaid expenses, the difference between current assets and quick assets is inventory:

\[
\text{Ending inventory} = \text{Current assets} - \text{quick assets}
\]

\[
= \$2,100,000 - \$1,800,000
\]

\[
= \$300,000
\]

Once ending inventory is known, average inventory can be determined \([\$500,000 + \$300,000] \div 2 = \$400,000\], and, finally, cost of sales can be calculated:

\[
\text{Cost of sales} \div \text{Average inventory} = \text{Inventory turnover}
\]

\[
\text{Cost of sales} \div \$400,000 = 8.0
\]

\[
\text{Cost of sales} = \$400,000 \times 8.0
\]

\[
= \$3,200,000
\]

- Answer (D) is incorrect because Summing, rather than averaging, beginning and ending inventory results in $6,400,000.
A change in credit policy has caused an increase in sales, an increase in discounts taken, a decrease in the amount of bad debts, and a decrease in the investment in accounts receivable. Based upon this information, the company’s

A. Average collection period has decreased.
B. Percentage discount offered has decreased.
C. Accounts receivable turnover has decreased.
D. Working capital has increased.

- Answer (A) is correct. An increase in discounts taken accompanied by declines in receivables balances and doubtful accounts all indicate that collections on the increased sales have been accelerated. Accordingly, the average collection period must have declined. The average collection period is a ratio calculated by dividing the number of days in a year (365) by the receivable turnover. Thus, the higher the turnover, the shorter the average collection period. The turnover increases when either sales (the numerator) increase, or receivables (the denominator) decrease. Accomplishing both higher sales and a lower receivables increases the turnover and results in a shorter collection period.
- Answer (B) is incorrect because a decrease in the percentage discount offered provides no incentive for early payment.
- Answer (C) is incorrect because Accounts receivable turnover (sales ÷ average receivables) has increased.
- Answer (D) is incorrect because no information is given relative to working capital elements other than receivables. Both receivables and cash are elements of working capital, so an acceleration of customer payments will have no effect on working capital.

To determine the operating cycle for a retail department store, which one of the following pairs of items is needed?

A. Days’ sales in accounts receivable and average merchandise inventory.
B. Cash turnover and net sales.
C. Accounts receivable turnover and inventory turnover.
D. Asset turnover and return on sales.

- Answer (A) is incorrect because cost of sales must be known to calculate days’ sales in inventory.
- Answer (B) is incorrect because these items are insufficient to permit determination of the operating cycle.
- Answer (C) is correct. The operating cycle is the time needed to turn cash into inventory, inventory into receivables, and receivables back into cash. For a retailer, it is the time from purchase of inventory to collection of cash. Thus, the operating cycle of a retailer is equal to the sum of the number of days’ sales in inventory and the number of days’ sales in receivables. Inventory turnover equals cost of goods sold divided by average inventory. The days’ sales in inventory equals 365 (or another period chosen by the analyst) divided by the inventory turnover. Accounts receivable turnover equals net credit sales divided by average receivables. The days’ sales in receivables equals 365 (or other number) divided by the accounts receivable turnover.
- Answer (D) is incorrect because these items are insufficient to permit determination of the operating cycle.

The ratio of sales to working capital is a measure of

A. Collectibility.
B. Financial leverage.
C. Liquidity.
D. Profitability.

- Answer (A) is incorrect because working capital includes cash and inventory, neither of which involve collectibility.
Answer (B) is incorrect because Financial leverage concerns the relationship between the use of debt capital and equity capital.

Answer (C) is correct. Like most ratios involving working capital, the working capital turnover (sales ÷ average working capital) is a measure of liquidity, which is the ability to meet obligations as they mature. However, it is also an activity measure, and a high turnover is preferable.

Answer (D) is incorrect because Profitability measures incorporate costs as well as revenues, assets, and liabilities.

A high sales-to-working-capital ratio could indicate

A. Unprofitable use of working capital.
B. Sales are not adequate relative to available working capital.
C. The firm is undercapitalized.
D. The firm is not susceptible to liquidity problems.

- Answer (A) is incorrect because A high ratio means low levels of working capital compared to sales. The firm may be using its current assets effectively.
- Answer (B) is incorrect because A high ratio means low levels of working capital compared to sales. The firm may be using its current assets effectively.
- Answer (C) is correct. A high sales-to-working-capital ratio is usually favorable because working capital, by itself, is an unprofitable use of resources. A firm does not earn money by holding cash, inventory, or receivables. Such assets should be minimized. However, a high ratio of sales to working capital may indicate either very high sales (a good situation) or a low supply of working capital (a potentially bad situation). Thus, a high ratio could indicate that a firm is undercapitalized and does not have the resources to invest in working capital.
- Answer (D) is incorrect because A high ratio may indicate insufficient working capital to support the company’s sales level, with resulting liquidity problems.

Carson Corporation computed the following items from its financial records for the current year:

<table>
<thead>
<tr>
<th>Current ratio</th>
<th>2 to 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory turnover</td>
<td>54 days</td>
</tr>
<tr>
<td>Accounts receivable turnover</td>
<td>24 days</td>
</tr>
<tr>
<td>Current liabilities turnover</td>
<td>36 days</td>
</tr>
</tbody>
</table>

The number of days in Carson’s operating cycle for the current year was

A. 60
B. 90
C. 78
D. 42

- Answer (A) is incorrect because The sum of the number of days’ sales in receivables and the number of days’ purchases in accounts payable is 60.
- Answer (B) is incorrect because The sum of the number of days’ sales in inventory and the number of days’ purchases in payables is 90.
- Answer (C) is correct. The operating cycle is the time needed to turn cash into inventory, inventory into receivables, and receivables back into cash. It is equal to the sum of the number of days’ sales in inventory and the number of days’ sales in receivables. The number of Carson’s days’ sales in inventory is given as 54 days. The number of days’ sales in receivables is given as 24. Therefore, the number of days in the operating cycle is 78 (54 + 24).
Answer (D) is incorrect because The sum of the number of days’ sales in inventory and the number of days’ sales in receivables minus the number of days’ purchases in payables is 42.

**[Fact Pattern #26]**
The data presented below show actual figures for selected accounts of McKeon Company for the fiscal year ended May 31, Year 1, and selected budget figures for the Year 2 fiscal year. McKeon’s controller is in the process of reviewing the Year 2 budget and calculating some key ratios based on the budget. McKeon Company monitors yield or return ratios using the average financial position of the company. (Round all calculations to three decimal places if necessary.)

<table>
<thead>
<tr>
<th></th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$210,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Noncurrent assets</td>
<td>275,000</td>
<td>255,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>78,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>75,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Common stock ($30 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>32,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**Year 2 Operations**

- Sales* $350,000
- Cost of goods sold 160,000
- Interest expense 3,000
- Income taxes (40% rate) 48,000
- Dividends declared and paid in Year 2 60,000
- Administrative expense 67,000

*All sales are credit sales.

**Current Assets**

<table>
<thead>
<tr>
<th></th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 20,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>100,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>70,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>20,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

[178] (Refers to Fact Pattern #26)
The Year 2 receivables turnover ratio for McKeon Company is

A. 1.882  
B. 3.500  
C. 5.000  
D. 4.118  

Answer (A) is incorrect because The receivables turnover ratio equals total credit sales divided by average accounts receivable.

Answer (B) is incorrect because The receivables turnover ratio equals total credit sales divided by average accounts receivable.
- Answer (C) is incorrect because the receivables turnover ratio equals total credit sales divided by average accounts receivable.
- Answer (D) is correct. The receivables turnover ratio is equal to the total credit sales divided by the average balance in accounts receivable. The average accounts receivable is equal to $85,000 \left[ \frac{($70,000 \text{ beginning balance} + $100,000 \text{ ending balance})}{2} \right]$. The receivables turnover ratio is therefore equal to 4.118 \left( \frac{$350,000 \text{ credit sales} + $85,000 \text{ average receivables}}{2} \right).

[179] (Refers to Fact Pattern #26)

Using a 365-day year, McKeon’s inventory turnover is

A. 171 days.
B. 160 days.
C. 183 days.
D. 78 days.

- Answer (A) is correct. Inventory turnover in terms of days is determined by dividing 365 by the inventory turnover ratio. The inventory turnover ratio is equal to the $160,000 cost of goods sold divided by the $75,000 average balance in inventory \left[ \frac{($80,000 \text{ beginning balance} + $70,000 \text{ ending balance})}{2} \right]. Hence, the inventory turnover ratio is 2.133 times per year. Dividing 365 by 2.133 results in an inventory turnover of 171 days.
- Answer (B) is incorrect because Inventory turnover in terms of days is determined by dividing 365 days by the inventory turnover ratio. The inventory turnover ratio equals the cost of goods sold divided by average inventory.
- Answer (C) is incorrect because Inventory turnover in terms of days is determined by dividing 365 days by the inventory turnover ratio. The inventory turnover ratio equals the cost of goods sold divided by average inventory.
- Answer (D) is incorrect because Inventory turnover in terms of days is determined by dividing 365 days by the inventory turnover ratio. The inventory turnover ratio equals the cost of goods sold divided by average inventory.

[180] (Refers to Fact Pattern #26)

McKeon Company’s total asset turnover ratio for Year 2 is

A. 0.805
B. 0.761
C. 0.722
D. 0.348

- Answer (A) is incorrect because the total asset turnover ratio equals sales divided by average total assets.
- Answer (B) is correct. Total asset turnover ratio is equal to $350,000 sales divided by average total assets. The amount of average total assets is equal to the average of beginning total assets of $435,000 ($180,000 current assets + $255,000 noncurrent assets) and ending total assets of $485,000 ($210,000 current assets + $275,000 noncurrent assets). The total asset turnover ratio is therefore equal to $350,000 \div $460,000.
- Answer (C) is incorrect because the total asset turnover ratio equals sales divided by average total assets.
- Answer (D) is incorrect because the total asset turnover ratio equals sales divided by average total assets.
The year-end financial statements for Queen Bikes reflect the data presented as follows. Ten percent of Queen’s net sales are in cash.

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>1,500 units at $100</td>
<td>1,200 units at $100</td>
<td>1,200 units at $125</td>
</tr>
<tr>
<td>Ending inventory</td>
<td>100 units at $50</td>
<td>100 units at $50</td>
<td>100 units at $50</td>
</tr>
<tr>
<td>Average receivables</td>
<td>$12,500</td>
<td>$12,000</td>
<td>$14,400</td>
</tr>
<tr>
<td>Net income</td>
<td>$18,750</td>
<td>$ 9,400</td>
<td>$26,350</td>
</tr>
</tbody>
</table>

Queen’s receivables turnover ratios for Year 2 and Year 3 are

A. 10.8 and 9.0, respectively.
B. 9.0 and 9.375, respectively.
C. 10.00 and 10.42, respectively.
D. 1.00 and 1.04, respectively.

- Answer (A) is incorrect because the ratios for Years 1 and 2 are 10.8 and 9.0.
- Answer (B) is correct. The receivables turnover ratio equals net credit sales divided by average accounts receivables. For Year 2 the calculation is \([($120,000 \times .9) \div $12,000] = 9.0\), and for Year 3 it is \([($150,000 \times .9) \div $14,400] = 9.375\).
- Answer (C) is incorrect because the ratios 10.00 and 10.42 are derived by incorrectly using 100% of net sales as the denominator instead of 90%.
- Answer (D) is incorrect because the ratios 1.00 and 1.04 are derived by incorrectly using 10% of net sales as the denominator instead of 90%.

Queen’s inventory turnover ratios for Year 2 and Year 3 are

A. 24 and 24, respectively.
B. 12 and 18, respectively.
C. 12 and 12, respectively.
D. 18 and 18, respectively.

- Answer (A) is incorrect because using sales dollars as the basis, turnover was 24 in Year 2.
- Answer (B) is incorrect because turnover for Year 2 and Year 3 was 12 ($60,000 COGS \div $5,000 average inventory).
- Answer (C) is correct. The cost of the 1,200 units sold in Year 2 at $50 each would have been $60,000. Dividing the $60,000 cost of sales by the $5,000 average inventory results in a turnover of 12. The 1,200 units sold in Year 3 also would have cost $60,000 and the turnover would again be 12.
- Answer (D) is incorrect because turnover for Year 2 and Year 3 was 12 ($60,000 COGS \div $5,000 average inventory).
[Fact Pattern #28]

Selected data from White Corporation’s financial statements for the year ended November 30, Year 2, are as follows (all sales are on credit).

<table>
<thead>
<tr>
<th>Financial Ratio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current ratio</td>
<td>1.4</td>
</tr>
<tr>
<td>Quick ratio</td>
<td>0.86</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>$450,000</td>
</tr>
<tr>
<td>Accounts receivable turnover</td>
<td>3.65</td>
</tr>
<tr>
<td>Merchandise inventory turnover</td>
<td>3.30</td>
</tr>
<tr>
<td>Rate of return on assets</td>
<td>6.5%</td>
</tr>
</tbody>
</table>

Selected account balances at November 30, Year 1

<table>
<thead>
<tr>
<th>Account</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable</td>
<td>$355,000</td>
</tr>
<tr>
<td>Merchandise inventory</td>
<td>237,000</td>
</tr>
</tbody>
</table>

Year 2 operations

<table>
<thead>
<tr>
<th>Operation</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,241,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>792,000</td>
</tr>
</tbody>
</table>

[183] (Refers to Fact Pattern #28)

Assuming that prepaid expenses are immaterial, White’s ending merchandise inventory is

A. $180,000
B. $243,000
C. $387,000
D. $630,000

- Answer (A) is incorrect because Current assets minus current liabilities is $180,000.
- Answer (B) is correct. Both the current ratio and quick ratio are given. The only difference between these two ratios is that inventory is included in the calculation of the current ratio, but not the quick ratio. The current ratio equals current assets divided by current liabilities. The current ratio is 1.4 times the current liabilities. Thus, current assets must be $630,000 ($450,000 × 1.4). The quick ratio is .86 [(current assets – merchandise inventory) ÷ current liabilities of $450,000]. Quick assets are $387,000 ($450,000 × .86). Since the only difference between current assets and quick assets is merchandise inventory (prepaid expenses are immaterial), merchandise inventory must be $243,000 ($630,000 current assets – $387,000 of quick assets).
- Answer (C) is incorrect because Quick assets equal $387,000.
- Answer (D) is incorrect because The current assets equal $630,000.

[184] (Refers to Fact Pattern #28)

White’s balance in accounts receivable at November 30, Year 2, is

A. $325,000
B. $216,986
C. $78,973
D. $355,000

- Answer (A) is incorrect because
- Answer (B) is incorrect because
- Answer (C) is incorrect because
- Answer (D) is incorrect because
Answer (A) is correct. The accounts receivable turnover (3.65) equals sales divided by the average balance in accounts receivable. Thus, dividing the $1,241,000 of sales by 3.65 gives an average receivables balance of $340,000. The average receivables balance is the average of the beginning and ending balances. Since the beginning balance was $355,000, the ending balance must be $325,000 [($340,000 \times 2) – $355,000].

Answer (B) is incorrect because The accounts receivable balance is not $216,986.

Answer (C) is incorrect because The accounts receivable balance is not $78,973.

Answer (D) is incorrect because The beginning balance in accounts receivable was $355,000.

[185] (Refers to Fact Pattern #28)
The approximate number of days in White’s operating cycle is

A. 100.0
B. 105.3
C. 110.6
D. 210.6

Answer (A) is incorrect because The average credit period equals 100.0 days (365 days ÷ 3.65).

Answer (B) is incorrect because The average of the average credit period and the average holding period is 105.3 days [(100.0 + 110.6) ÷ 2].

Answer (C) is incorrect because The average holding period is equals 110.6 days (365 ÷ 3.30).

Answer (D) is correct. The operating cycle is the time required to convert cash into inventory, sell that inventory for receivables, and collect cash in payment of the receivables. The operating cycle is therefore a cash-to-cash cycle: the time that a company holds inventory before sale plus the time that it holds receivables before collection. Dividing the receivables turnover of 3.65 into 365 days gives the average credit period (100 days). Dividing the inventory turnover of 3.30 into 365 days gives the average holding period (110.6 days). The sum of the inventory holding period and the credit period is the operating cycle (210.6 days).

[Fact Pattern #29]

Selected data from Ostrander Corporation’s financial statements for the years indicated are presented in thousands.

<table>
<thead>
<tr>
<th>Net credit sales</th>
<th>Year 2 Operations</th>
<th>December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4,175</td>
<td>Cash</td>
<td>$    32 $ 28</td>
</tr>
<tr>
<td>Cost of goods sold $2,880</td>
<td>Trading securities</td>
<td>169 172</td>
</tr>
<tr>
<td>Interest expense</td>
<td>Accounts receivable (net)</td>
<td>210 204</td>
</tr>
<tr>
<td>Income tax</td>
<td>Merchandise inventory</td>
<td>440 420</td>
</tr>
<tr>
<td>Gain on disposal of a segment</td>
<td>Tangible fixed assets</td>
<td>480 440</td>
</tr>
<tr>
<td>(net of tax)</td>
<td>Total assets</td>
<td>1,397 1,320</td>
</tr>
<tr>
<td>Administrative expense</td>
<td>Current liabilities</td>
<td>370 368</td>
</tr>
<tr>
<td>Net income</td>
<td>Total liabilities</td>
<td>790 750</td>
</tr>
<tr>
<td></td>
<td>Common stock outstanding</td>
<td>226 210</td>
</tr>
<tr>
<td></td>
<td>Retained earnings</td>
<td>381 360</td>
</tr>
</tbody>
</table>
The number of days of receivables (using 365 days) for Ostrander Corporation in Year 2 is

A. 18.10 days.
B. 20.17 days.
C. 17.83 days.
D. 18.36 days.

- Answer (A) is correct. The average number of days’ sales in receivables equals 365 days divided by the accounts receivable turnover. The accounts receivable turnover is determined by dividing the average accounts receivable balance into sales. The average balance was $207 \text{[}($204 + $210) \div 2\text{]}$. Dividing $207$ into sales of $4,175$ produces an average turnover rate of 20.1691 times. Thus, the average days’ sales in receivables was 18.097 days (365 ÷ 20.1691).
- Answer (B) is incorrect because the average turnover rate is 20.17.
- Answer (C) is incorrect because the number 17.83 is calculated using the Year 1 ending balance, not the average balance, in accounts receivable to calculate the average turnover rate.
- Answer (D) is incorrect because using the Year 2 ending balance, not the average balance, in accounts receivable to calculate the average turnover rate results in 18.36.

In computing inventory turnover, the preferred base to use is the

A. Sales base because it is more likely to reflect a change in trend.
B. Sales base because it provides turnover rates that are considerably higher.
C. Cost of sales base because it is not affected by the method used to value inventory.
D. Cost of sales base because it eliminates any changes due solely to sales price changes.

- Answer (A) is incorrect because using a sales base involves comparing a retail amount with a cost amount (inventory).
- Answer (B) is incorrect because using a sales base involves comparing a retail amount with a cost amount (inventory).
- Answer (C) is incorrect because cost of sales is affected by the method used to value inventory, for example, the inventory flow assumption (FIFO, LIFO, etc.).
- Answer (D) is correct. Inventory turnover is measured by dividing the cost of sales by average inventories. Cost of sales is used rather than sales because the cost of sales base eliminates any changes caused solely by sales price changes. Furthermore, using sales in the numerator is inconsistent with valuing inventories at cost in the denominator.
Selected data from Sheridan Corporation’s year-end financial statements are presented below. The difference between average and ending inventory is immaterial.

- Current ratio: 2.0
- Quick ratio: 1.5
- Current liabilities: $120,000
- Inventory turnover (based on cost of goods sold): 8 times
- Gross profit margin: 40%

Sheridan’s net sales for the year were

A. $800,000
B. $480,000
C. $1,200,000
D. $240,000

- Answer (A) is correct. Net sales can be calculated indirectly from the inventory turnover ratio and the other ratios given. If the current ratio is 2.0, and current liabilities are $120,000, current assets must be $240,000 (2.0 × $120,000). Similarly, if the quick ratio is 1.5, the total quick assets must be $180,000 (1.5 × $120,000). The only major difference between quick assets and current assets is that inventory is not included in the definition of quick assets. Consequently, ending inventory must be $60,000 ($240,000 – $180,000). The inventory turnover ratio (COGS ÷ average inventory) is 8. Thus, cost of goods sold must be 8 times average inventory, or $480,000, given no material difference between average and ending inventory. If the gross profit margin is 40%, the cost of goods sold percentage is 60%, cost of goods sold equals 60% of sales, and net sales must be $800,000 ($480,000 ÷ 60%).

- Answer (B) is incorrect because Cost of goods sold is $480,000.
- Answer (C) is incorrect because The amount of $1,200,000 is based on a 60% gross profit margin.
- Answer (D) is incorrect because Current assets equal $240,000.
Lisa, Inc.
Statement of Financial Position
December 31, Year 2
(000s)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$  30</td>
<td>$  25</td>
</tr>
<tr>
<td>Trading securities</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>170</td>
<td>140</td>
</tr>
<tr>
<td>Long-term investments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Securities (at cost)</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Property, plant, &amp; equipment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Building (net)</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>Intangible assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patents (net)</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total long-term assets</strong></td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$500</td>
<td>$455</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities &amp; Shareholders’ Equity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current liabilities:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$  23</td>
<td>$  12</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>47</td>
<td>28</td>
</tr>
<tr>
<td>Accrued interest</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td>85</td>
<td>55</td>
</tr>
<tr>
<td>Long-term debt:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable 10% due 12/31/Year 9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Bonds payable 12% due 12/31/Year 8</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total long-term debt</strong></td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>$110</td>
<td>$  80</td>
</tr>
<tr>
<td>Shareholders’ equity:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred -- 5% cumulative, $100 par, non-participating, 1,000 shares authorized, issued and outstanding</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Common -- $10 par 20,000 shares authorized, 15,000 issued and outstanding</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Additional paid-in capital -- common</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>65</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total shareholders’ equity</strong></td>
<td>$390</td>
<td>$375</td>
</tr>
<tr>
<td><strong>Total liabilities &amp; equity</strong></td>
<td>$500</td>
<td>$455</td>
</tr>
</tbody>
</table>
Assume net credit sales and cost of goods sold for Year 2 were $300,000 and $220,000, respectively. Lisa, Inc.’s accounts receivable turnover for Year 2 was

A. 4.9 times.
B. 5.9 times.
C. 6.7 times.
D. 8.0 times.

- Answer (A) is incorrect because the number 4.9 can be obtained only by using year-end receivables in the denominator and cost of goods sold in the numerator.
- Answer (B) is incorrect because cost of goods sold divided by average receivables equals 5.9.
- Answer (C) is incorrect because the number 6.7 is based on the ending receivables.
- Answer (D) is correct. The accounts receivable turnover is computed by dividing the net credit sales by average accounts receivable. The average is $37,500 \left(\frac{\$45,000 + \$30,000}{2}\right)$. Hence, the turnover is 8.0 \left(\frac{\$300,000}{\$37,500}\right).

Assume net credit sales and cost of goods sold for Year 2 were $300,000 and $220,000, respectively. Lisa, Inc.’s average collection period for Year 2, using a 360-day year, was

A. 36 days.
B. 45 days.
C. 54 days.
D. 61 days.

- Answer (A) is incorrect because using a turnover of 10.0, a rate based on beginning receivables, results in 36 days.
- Answer (B) is correct. The average collection period is calculated by dividing 360 days by the accounts receivables turnover of 8.0 \left(\frac{\$300,000}{\left(\frac{\$45,000 + \$30,000}{2}\right)}\right). Thus, the average collection period is 45 days \left(\frac{360}{8.0}\right).
- Answer (C) is incorrect because a period of 54 days requires a turnover of 6.7, a rate based on ending receivables.
- Answer (D) is incorrect because a period of 61 days requires a turnover of 5.9, a rate based using cost of sales in the numerator.

Assume sales and cost of goods sold for Year 2 were $300,000 and $220,000, respectively. Lisa, Inc.’s inventory turnover for Year 2 was

A. 3.7 times.
B. 4.0 times.
C. 4.4 times.
D. 5.0 times.

- Answer (A) is incorrect because the number 3.7 is based on the ending inventory.
- Answer (B) is incorrect. The inventory turnover is computed by dividing cost of goods sold by average inventory. Consequently, the turnover is 4 times \left(\frac{\$220,000}{\left(\frac{\$60,000 + \$50,000}{2}\right)}\right).
- Answer (C) is incorrect because the number 4.4 is based on the beginning inventory.
- Answer (D) is incorrect because sales divided by ending inventory equal 5.0.
A ratio that measures the movement of current assets is

A. Working capital turnover.
B. Working capital to total assets.
C. Return on owners’ equity.
D. The current ratio.

- Answer (A) is correct. Ratios that measure movement of assets are known as turnover ratios. Working capital turnover measures the firm’s use of working capital in relation to sales. Sales are divided by average working capital. A high turnover is preferred.
- Answer (B) is incorrect because Comparing one group of assets (working capital) to total assets does not measure activity.
- Answer (C) is incorrect because Return on equity is a measure of income or profitability, not asset activity.
- Answer (D) is incorrect because The current ratio measures solvency, or the adequacy of working capital, not its movement.
### RST Corporation Comparative Income Statements for the Years 5 and 6

<table>
<thead>
<tr>
<th></th>
<th>Year 6</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (all are credit)</td>
<td>$285,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>150,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$135,000</td>
<td>$ 80,000</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
<td>65,000</td>
<td>36,000</td>
</tr>
<tr>
<td>Income before interest and income taxes</td>
<td>$ 70,000</td>
<td>$ 44,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>$ 67,000</td>
<td>$ 41,000</td>
</tr>
<tr>
<td>Income tax expense</td>
<td>27,000</td>
<td>16,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 40,000</td>
<td>$ 25,000</td>
</tr>
</tbody>
</table>

### RST Corporation Comparative Balance Sheets End of Years 5 and 6

<table>
<thead>
<tr>
<th></th>
<th>Year 6</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$5,000</td>
<td>$4,000</td>
</tr>
<tr>
<td>Short-term marketable investments</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>16,000</td>
<td>14,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>30,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$54,000</td>
<td>$40,000</td>
</tr>
<tr>
<td><strong>Noncurrent assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term investments</td>
<td>11,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Property, plant, and equipment</td>
<td>80,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Intangibles</td>
<td>3,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Total assets</td>
<td>$148,000</td>
<td>$125,000</td>
</tr>
</tbody>
</table>

| **Liabilities and Stockholders’ Equity** |        |        |
| Current liabilities:               |        |        |
| Accounts payable                   | $11,000 | $ 7,000 |
| Accrued payables                   | 1,000   | 1,000   |
| Total current liabilities          | $12,000 | $ 8,000 |
| Long-term Liabilities:             |        |        |
| 0% Bonds payable, due in Year 12   | 30,000  | 30,000  |
| Total liabilities                  | $42,000 | $38,000 |
| **Stockholders’ equity:**          |        |        |
| Common stock, 2,400 shares, $10 par | $24,000 | $24,000 |
| Retained earnings                  | 82,000  | 63,000  |
| **Total stockholders’ equity**     | $106,000 | $87,000 |
| **Total liabilities and stockholders’ equity** | $148,000 | $125,000 |

The market value of RST’s common stock at the end of Year Six was $100.00 per share.
RST’s accounts receivable turnover for Year 6 is

A. 19 times.
B. 17.8 times
C. 16.2 times
D. 10 times.

- Answer (A) is correct. The accounts receivable turnover equals net credit sales divided by average trade receivables (net). In Year 6, the accounts receivable turned over 19 times \( \frac{\$285,000}{\left(\frac{\$16,000 \text{ ending A/R} + \$14,000 \text{ beginning A/R}}{2}\right)} \).
- Answer (B) is incorrect because Net credit sales divided by net accounts receivable at the end of Year 6 equals 17.8.
- Answer (C) is incorrect because Dividing average sales of Years 5 and 6 \( \frac{\$285,000 + \$200,000}{2} \) by average receivables \( \frac{\$16,000}{2} \) results in 16.2 times, which produces no meaningful ratio.
- Answer (D) is incorrect because Dividing cost of goods sold \( \$150,000 \) for Year 6 by average accounts receivable \( \frac{\$15,000}{2} \) results in 10 times, which produces no meaningful ratio.

A company sells 10,000 skateboards a year at $66 each. All sales are on credit, with terms of 3/10, net 30, that is, a 3% discount if payment is made within 10 days; otherwise full payment is due at the end of 30 days. One half of the customers are expected to take advantage of the discount and pay on day 10. The other half are expected to pay on day 30. Sales are expected to be uniform throughout the year for both types of customers.

What is the expected average collection period for the company?

A. 5 days.
B. 10 days.
C. 15 days.
D. 20 days.

- Answer (A) is incorrect because Assuming half of the customers pay on day 10 but ignoring the remaining customers results in 5 days.
- Answer (B) is incorrect because Assuming all customers take the discount results in 10 days.
- Answer (C) is incorrect because The amount of 15 days assumes half of the customers pay on day 30 but ignores the remaining half of the customers who pay on day 10.
- Answer (D) is correct. The average collection period is the average time it takes to receive payment from customers. Because one-half of the customers will pay on day 10 and half will pay on day 30, the average collection period is 20 days \[ .5(10 \text{ days}) + .5(30 \text{ days}) \].
Assume that the average collection period is 25 days. After the credit policy is well established, what is the expected average accounts receivable balance for the company at any point in time, assuming a 365-day year?

A. $1,808.22  
B. $27,123.30  
C. $36,164.38  
D. $45,205.48

- Answer (A) is incorrect because the credit sales per day equal $1,808.22.  
- Answer (B) is incorrect because the amount of $27,123.30 is based on a 15-day average collection period.  
- Answer (C) is incorrect because assuming a 20-day average collection period results in $36,164.38.  
- Answer (D) is correct. The expected average accounts receivable balance equals the average collection period times the credit sales per day. Thus, the average accounts receivable balance is $45,205.48 \(\frac{(10,000 \text{ units sold on credit} \times \$66 \text{ price})}{365 \text{ days}} \times 25 \text{ days}\). The foregoing calculation assumes that receivables are recorded at their gross amounts.

Volpone Company’s average number of days to sell inventory for Year 2 is

A. 51.18  
B. 65.00  
C. 71.51  
D. 72.50

- Answer (A) is incorrect because the number of 51.18 days is based on sales, not cost of sales. Sales are recorded at retail prices.  
- Answer (B) is incorrect because the number of 65.00 days is based on the beginning inventory.  
- Answer (C) is incorrect because the number of 71.51 days is based on a 360-day year, not a 365-day year.  
- Answer (D) is correct. The average days to sell inventory equals 365 days divided by the inventory turnover (cost of goods sold ÷ average inventory). Thus, turnover is 5.0345 times \(\frac{4,380,000 \text{ COGS}}{(960,000 + 780,000) ÷ 2}\). Average days to sell inventory is 72.5 days \(\frac{365}{5.0345}\).
Volpone Company's operating cycle for Year 2 is

A. 70.61
B. 93.09
C. 92.21
D. 99.71

- Answer (A) is incorrect because the inventory alone is held for 72.50 days.
- Answer (B) is incorrect because the number of 93.09 days is based on the ending receivables balance.
- Answer (C) is correct. The operating cycle is the length of time it takes a company to complete normal operating activities. Thus, the operating cycle is a cash-to-cash cycle equivalent to the average time that inventory is held plus the average time that receivables are held. Volpone holds its inventory 72.50 days \( \left( \frac{365 \text{ days}}{\$4,380,000 \text{ COGS} \div \$870,000 \text{ average inventory}} \right) \) and its receivables 19.71 days \( \left( \frac{365 \text{ days}}{\$6,205,000 \text{ sales} \div \$335,000 \text{ average receivables}} \right) \). Its operating cycle is 92.21 days \( (72.50 + 19.71) \).
- Answer (D) is incorrect because the number of 99.71 days is based on the ending inventory.

Volpone Company's average number of days to collect accounts receivable for Year 2 is

A. 18.82
B. 19.43
C. 19.71
D. 20.59

- Answer (A) is incorrect because the number of 18.82 days is based on receivables of $320,000.
- Answer (B) is incorrect because the number of 19.43 days is based on a 360-day year.
- Answer (C) is correct. The average collection period equals 365 days divided by the receivables turnover (net credit sales ÷ average accounts receivable). Turnover is 18.52 times \( \left( \frac{\$6,205,000 \text{ sales}}{\left( \frac{(\$350,000 + \$320,000)}{2} \right) \div 2} \right) \). Hence, the average collection period is 19.71 days \( (365 \div 18.52) \).
- Answer (D) is incorrect because the number 20.59 days is based on receivables of $350,000.

The Irwin Corporation has $3 million per year in credit sales. The company’s average day’s sales outstanding is 40 days. Assuming a 360-day year, what is Irwin’s average amount of accounts receivable outstanding?

A. $500,000
B. $333,333
C. $250,000
D. $75,000

- Answer (A) is incorrect because using 60 days outstanding results in $500,000.
- Answer (B) is correct. Dividing $3 million of sales by 360 days results in an average of $8,333.33 per day. Multiplying the average daily sales by the 40 days outstanding results in $333,333.
- Answer (C) is incorrect because using 30 days outstanding results in $250,000.
- Answer (D) is incorrect because dividing sales by 40 days results in $75,000, which is a meaningless solution.
Last year, Johnson Company’s days’ sales in receivables was 73 days. This year, days’ sales in receivables is 91.25 days. Over the same time period, sales have declined by 20%. In this period of time, what has happened to the level of Johnson Company’s accounts receivable?

A. Accounts receivables have increased.
B. Accounts receivables have decreased.
C. There has been no change in accounts receivable.
D. There is not enough information provided to make a determination.

- Answer (A) is incorrect because Sales decreased while days’ sales in receivables proportionally increased; no change in accounts receivable resulted.
- Answer (B) is incorrect because The inverse, proportional changes in days’ sales in receivables and sales resulted in no change in the balance of receivables.
- Answer (C) is correct. The changes can best be understood by using illustrative numbers. If prior year sales were $1,000, a 20% decline results in current year sales of $800. The formula for days’ sales in receivables can be restated as follows:

\[
\text{Days' sales in receivable} = \frac{365 \times AR}{\text{Turnover}} = \frac{365 \times (Sales + AR)}{\text{Sales}} = \frac{365 \times (AR \div Sales)}{\text{Sales}}
\]

<table>
<thead>
<tr>
<th>Current Year</th>
<th>Prior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>365 × (AR ÷ $800) = 91.25</td>
<td>365 × (AR ÷ $1,000) = 73</td>
</tr>
<tr>
<td>365 × AR = $73,000</td>
<td>365 × AR = $73,000</td>
</tr>
<tr>
<td>AR = $200</td>
<td>AR = $200</td>
</tr>
</tbody>
</table>

Thus, there was no change in the balance of accounts receivables.
- Answer (D) is incorrect because The zero net effect on accounts receivable can be determined from the information given.

The selected data pertain to a company at December 31:

- Quick assets $208,000
- Acid test ratio 2.6 to 1
- Current ratio 3.5 to 1
- Net sales for the year $1,800,000
- Cost of sales for the year $990,000
- Average total assets for the year $1,200,000

The company’s asset turnover ratio for the year is

A. .675
B. .825
C. 1.21
D. 1.50

- Answer (A) is incorrect because Asset turnover equals net sales divided by average total assets.
- Answer (B) is incorrect because Asset turnover equals net sales divided by average total assets.
- Answer (C) is incorrect because Asset turnover equals net sales divided by average total assets.
Answer (D) is correct. The asset turnover ratio equals $1,800,000 of net sales divided by $1,200,000 of average total assets. The asset turnover ratio is therefore equal to 1.5.

[202] The ratio that measures a firm’s ability to generate earnings from its resources is

A. Days’ sales in inventory.
B. Sales to working capital.
C. Days’ sales in receivables.
D. Asset turnover.

- Answer (A) is incorrect because the number of days’ sales in inventory measures the number of days that inventory is held before being sold; it reflects the efficiency of inventory management.
- Answer (B) is incorrect because the ratio of sales to working capital measures the ability to generate earnings from only a portion of a firm’s resources.
- Answer (C) is incorrect because the number of days’ sales in receivables indicates only the efficiency of receivables management.
- Answer (D) is correct. Asset turnover measures the level of capital investment relative to sales volume. It is a measure of how well a company uses its assets. A high turnover is preferable because it signifies that a given level of resources is being used to generate greater sales.

[Fact Pattern #34]
Broomall Corporation has decided to include certain financial ratios in its year-end annual report to shareholders. Selected information relating to its most recent fiscal year is provided below.

<table>
<thead>
<tr>
<th>Cash</th>
<th>$10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable:</td>
<td></td>
</tr>
<tr>
<td>– Beginning of year</td>
<td>$24,000</td>
</tr>
<tr>
<td>– End of year</td>
<td>$20,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>$8,000</td>
</tr>
<tr>
<td>Inventory:</td>
<td></td>
</tr>
<tr>
<td>– Beginning of year</td>
<td>$26,000</td>
</tr>
<tr>
<td>– End of year</td>
<td>$30,000</td>
</tr>
<tr>
<td>Available-for-sale securities:</td>
<td></td>
</tr>
<tr>
<td>– Historical cost</td>
<td>$9,000</td>
</tr>
<tr>
<td>– Fair value at year end</td>
<td>$12,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$15,000</td>
</tr>
<tr>
<td>Notes payable (due in 90 days)</td>
<td>$25,000</td>
</tr>
<tr>
<td>Bonds payable (due in 10 years)</td>
<td>$35,000</td>
</tr>
<tr>
<td>Net credit sales for year</td>
<td>$220,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>$140,000</td>
</tr>
</tbody>
</table>
Using a 365-day year, Broomall’s accounts receivable turnover period is

- A. 26.1 days.
- B. 33.2 days.
- C. 36.5 days.
- D. 39.8 days.

- Answer (A) is incorrect because a period of 26.1 days results from using accounts payable instead of accounts receivable.
- Answer (B) is incorrect because a period of 33.2 days results from using ending, rather than average, receivables in the denominator.
- Answer (C) is correct. The accounts receivable turnover period, also called the days’ sales in receivables, equals the number of days in the year divided by the accounts receivable turnover ratio. Broomall’s turnover ratio is 10 times \( \frac{220 \text{ net credit sales}}{\left[ (24,000 + 20,000) / 2 \right] \text{平均应收账款余额}} \), generating a turnover period of 36.5 days (365 days ÷ 10).
- Answer (D) is incorrect because a period of 39.8 days results from using beginning, rather than average, receivables in the denominator.

Broomall’s average inventory turnover for the year was

- A. 4.7 times.
- B. 5.0 times.
- C. 5.4 times.
- D. 7.9 times.

- Answer (A) is incorrect because a turnover rate of 4.667 results from using ending, rather than average, inventory in the denominator.
- Answer (B) is correct. The inventory turnover ratio equals cost of goods sold divided by the average inventory balance. Broomall’s inventory turnover for the year was thus 5 times \( \frac{140,000 \text{ cost of goods sold}}{\left[ (26,000 + 30,000) / 2 \right] \text{平均库存}} \).
- Answer (C) is incorrect because a turnover rate of 5.385 results from using beginning, rather than average, inventory in the denominator.
- Answer (D) is incorrect because a turnover rate of 7.86 results from using sales, rather than cost of goods sold, in the numerator.

Maydale, Inc.’s financial statements show the following information:

- Accounts receivable, end of Year 1 \( \$320,000 \)
- Credit sales for Year 2 \( 3,600,000 \)
- Accounts receivable, end of Year 2 \( 400,000 \)

Maydale’s accounts receivable turnover ratio is

- A. 0.10
- B. 9.00
- C. 10.00
- D. 11.25
Answer (A) is incorrect because a ratio of 0.1 results from reversing the numerator and denominator of the ratio. 

Answer (B) is incorrect because a ratio of 9 times results from using ending, rather than average, receivables in the denominator. 

Answer (C) is incorrect. The accounts receivable turnover ratio equals net credit sales divided by average accounts receivable. Maydale’s accounts receivable turnover ratio is thus 10 times \( \frac{3,600,000}{(320,000 + 400,000) / 2} \). 

Answer (D) is incorrect because a ratio of 11.25 times results from using beginning, rather than average, receivables in the denominator.

Zubin Corporation experiences a decrease in sales and cost of goods sold, an increase in accounts receivable, and no change in inventory. If all else is held constant, what is the total effect of these changes on the receivables turnover and inventory ratios?

<table>
<thead>
<tr>
<th>Inventory Turnover</th>
<th>Receivables Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased</td>
<td>Increased</td>
</tr>
<tr>
<td>Decreased</td>
<td>Decreased</td>
</tr>
</tbody>
</table>

Answer (A) is incorrect because the numerators of both ratios have decreased, leading to decreases in both ratios. 

Answer (B) is incorrect because the inventory turnover ratio decreased also. 

Answer (C) is incorrect because the receivables turnover ratio decreased also. 

Answer (D) is correct. Cost of goods sold is the numerator of the inventory turnover ratio and average inventory is the denominator. A decrease in the numerator accompanied by an unchanged denominator results in a decrease in the overall ratio. Net credit sales is the numerator of the receivables turnover ratio and average net receivables is the denominator. A decrease in the numerator and an increase in the denominator result in a decrease in the overall ratio.

On its year-end financial statements, Caper Corporation showed sales of $3,000,000, net fixed assets of $1,300,000, and total assets of $2,000,000. The company’s fixed asset turnover is

A. 1.5 times. 
B. 43.3%. 
C. 2.3 times. 
D. 65%.

Answer (A) is incorrect because a turnover of 1.5 times results from improperly dividing sales by total assets rather than fixed assets. 

Answer (B) is incorrect because the percentage of 43.3 results from reversing the numerator and denominator. 

Answer (C) is correct. Fixed asset turnover measures a firm’s efficiency at using fixed assets to generate sales and is calculated as sales divided by net property, plant, and equipment. Caper thus turned over its fixed assets 2.3 times during the year ($3,000,000 ÷ $1,300,000). 

Answer (D) is incorrect because the percentage of 65 is the proportion of total assets made up by fixed assets.
The assets of Moreland Corporation are presented below:

<table>
<thead>
<tr>
<th></th>
<th>January 1</th>
<th>December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$48,000</td>
<td>$62,000</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>42,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>68,000</td>
<td>47,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>125,000</td>
<td>138,000</td>
</tr>
<tr>
<td>Plant &amp; equipment (net of accumulated depreciation)</td>
<td>325,000</td>
<td>424,000</td>
</tr>
</tbody>
</table>

For the year just ended, Moreland had net income of $96,000 on $900,000 of sales. Moreland’s total asset turnover ratio is

A. 1.27  
B. 1.37  
C. 1.48  
D. 1.50

- Answer (A) is incorrect because a turnover of 1.27 results from using only the ending, rather than average, asset balances.
- Answer (B) is correct. Total asset turnover measures a firm’s efficiency at using all its assets to generate sales.
- Answer (C) is incorrect because a turnover of 1.48 results from using only the beginning, rather than average, asset balances.
- Answer (D) is incorrect because a turnover of 1.5 results from failing to include accounts receivable in total assets.

The controller of Palmito Company has gathered the following information:

<table>
<thead>
<tr>
<th></th>
<th>Beginning of Year</th>
<th>End of Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory</td>
<td>$6,400</td>
<td>$7,600</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>2,140</td>
<td>3,060</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>3,320</td>
<td>3,680</td>
</tr>
</tbody>
</table>

Total sales for the year were $85,900, of which $62,400 were credit sales. The cost of goods sold was $24,500.
Palmito’s inventory turnover ratio for the year was

A. 3.2 times.
B. 3.5 times.
C. 8.2 times.
D. 8.9 times.

- Answer (A) is incorrect because a turnover of 3.2 times results from using ending, rather than average, inventory.
- Answer (B) is correct. Palmito’s inventory turnover can be calculated as follows:

  \[
  \text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}
  \]

  \[
  = \frac{24,500}{(6,400 + 7,600)/2}
  = \frac{24,500}{7,000}
  = 3.5
  \]

- Answer (C) is incorrect because a turnover of 8.2 times results from dividing credit sales, rather than cost of goods sold, by ending inventory, rather than average inventory.
- Answer (D) is incorrect because a turnover of 8.9 times results from dividing credit sales, rather than cost of goods sold, by average inventory.

Palmito’s payables turnover ratio for the year was

A. 7.3 times
B. 7.0 times.
C. 16.9 times.
D. 17.8 times.

- Answer (A) is correct. Palmito’s payables turnover can be calculated as follows:

  \[
  \text{Payables turnover} = \frac{\text{Purchases}}{\text{Average accounts payable}}
  \]

  \[
  = \frac{25,700}{(3,320 + 3,680)/2}
  = \frac{25,700}{3,500}
  = 7.3
  \]

Purchases are calculated as follows:

<table>
<thead>
<tr>
<th>Cost of goods sold</th>
<th>$24,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plus: Ending inventory</td>
<td>7,600</td>
</tr>
<tr>
<td>Goods available for sale</td>
<td>$32,100</td>
</tr>
<tr>
<td>Less: Beginning inventory</td>
<td>(6,400)</td>
</tr>
<tr>
<td>Purchases</td>
<td>$25,700</td>
</tr>
</tbody>
</table>

- Answer (B) is incorrect because a turnover of 7.0 times results from using cost of goods sold, rather than accrual-basis purchases, in the numerator.
- Answer (C) is incorrect because a turnover of 16.96 times results from using credit sales, rather than cost of goods sold, in the numerator, and ending, rather than average, inventory in the denominator.
Answer (D) is incorrect because a turnover of 17.8 times results from using credit sales rather than purchases in the numerator.

[Fact Pattern #36]
Garland Corporation’s income statement for the year just ended is shown below.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net sales</td>
<td>$ 900,000</td>
</tr>
<tr>
<td>Beginning inventory</td>
<td>$ 125,000</td>
</tr>
<tr>
<td>Purchases</td>
<td>(540,000)</td>
</tr>
<tr>
<td>Goods available for sale</td>
<td>$ 665,000</td>
</tr>
<tr>
<td>Ending inventory</td>
<td>(138,000)</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>(527,000)</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$ 373,000</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>(175,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 198,000</td>
</tr>
<tr>
<td>Income tax expense</td>
<td>(79,000)</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 119,000</td>
</tr>
</tbody>
</table>

[211] (Refers to Fact Pattern #36)
Garland’s average inventory turnover ratio is

A. 6.84
B. 6.52
C. 4.01
D. 3.82

- Answer (A) is incorrect because a turnover of 6.84 times results from using net sales, rather than cost of goods sold, in the numerator.
- Answer (B) is incorrect because a turnover of 6.52 times results from using net sales, rather than cost of goods sold, in the numerator, and ending, rather than average, inventory in the denominator.
- Answer (C) is correct. Garland’s inventory turnover ratio can be calculated as follows:

  
  \[
  \text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{527,000}{(125,000 + 138,000)/2} = \frac{527,000}{131,500} = 4.0076 \text{ times}
  
  \]

- Answer (D) is incorrect because a turnover of 3.82 times results from improperly using ending, rather than average, inventory in the denominator.
If Garland Corporation’s net accounts receivable were $68,000 and $47,000 at the beginning and end of the year, respectively, the company’s average number of days’ sales in accounts receivable (using a 360-day year) is

A. 8 days.
B. 13 days.
C. 19 days.
D. 23 days.

- Answer (A) is incorrect because The correct answer is 23.
- Answer (B) is incorrect because Thirteen is the turnover based on beginning receivables rather than the number of days.
- Answer (C) is incorrect because Nineteen is based on the use of year-end receivables rather than the average receivables for the year.
- Answer (D) is correct. Garland’s accounts receivable turnover ratio can be calculated as follows:

\[
\text{AR turnover} = \frac{\text{Net credit sales}}{\text{Average accounts receivable}} = \frac{\$900,000}{\left(\frac{\$68,000 + \$47,000}{2}\right)} = \frac{\$900,000}{\$57,500} = 15.652 \text{ times}
\]

\[
\text{Days' sales in receivables} = \frac{360}{\text{Accounts receivable turnover}} = \frac{360}{15.652} = 23 \text{ days}
\]

Globetrade is a retailer that buys virtually all of its merchandise from manufacturers in a country experiencing significant inflation. Globetrade is considering changing its method of inventory costing from first-in, first-out (FIFO) to last-in, first-out (LIFO). What effect would the change from FIFO to LIFO have on Globetrade’s current ratio and inventory turnover ratio?

A. Both the current ratio and the inventory turnover ratio would increase.
B. The current ratio would increase but the inventory turnover ratio would decrease.
C. The current ratio would decrease but the inventory turnover ratio would increase.
D. Both the current ratio and the inventory turnover ratio would decrease.

- Answer (A) is incorrect because The current ratio would decrease due to the lower inventory value under LIFO.
- Answer (B) is incorrect because The current ratio would decrease due to the lower inventory value under LIFO.
- Answer (C) is correct. During periods of high inflation, manufacturers and retailers often switch to LIFO inventory valuation as a tax postponement tool. The higher costs attaching to more recent inventory pass into cost of goods sold, reducing net income and tax liability. Since cost of goods sold is the numerator of the inventory turnover ratio, turnover will increase. Also, inventory will be lower under LIFO, which reduces the current ratio and increases the turnover ratio.
- Answer (D) is incorrect because The inventory turnover would increase due to higher cost of goods sold and lower inventory.
Lancaster, Inc., had net accounts receivable of $168,000 and $147,000 at the beginning and end of the year, respectively. The company’s net income for the year was $204,000 on $1,700,000 in total sales. Cash sales were 6% of total sales. Lancaster’s average accounts receivable turnover ratio for the year is

A. 9.51  
B. 10.15  
C. 10.79  
D. 10.87

- Answer (A) is incorrect because a turnover of 9.51 times results from using beginning, rather than average, receivables in the denominator.
- Answer (B) is correct. Lancaster’s accounts receivable turnover ratio can be calculated as follows:

\[
\text{AR turnover} = \frac{\text{Net credit sales}}{\text{Average accounts receivable}} = \frac{(1,700,000 \times 0.94)}{\frac{(168,000 + 147,000)}{2}} = \frac{1,598,000}{157,500} = 10.145 \text{ times}
\]

- Answer (C) is incorrect because a turnover of 10.79 times results from using total sales, rather than credit sales, in the numerator.
- Answer (D) is incorrect because a turnover of 10.87 times results from using ending, rather than average, receivables in the denominator.

The following financial information is given for Anjuli Corporation (in millions of dollars):

<table>
<thead>
<tr>
<th>Prior Year</th>
<th>Current Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$10</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>6</td>
</tr>
<tr>
<td>Current assets:</td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>2</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>3</td>
</tr>
<tr>
<td>Inventory</td>
<td>4</td>
</tr>
</tbody>
</table>

Based on year-end figures for assets, between the prior year and the current year, did the days’ sales in inventory and days’ sales in receivables for Anjuli increase or decrease? Assume a 365-day year.

A. Increased  
B. Increased  
C. Decreased  
D. Decreased
Answer (A) is correct. Anjuli’s inventory turnover ratio for the current year can be calculated as follows:

\[
\text{Inventory turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{\$7,000,000}{\$5,000,000} = 1.4 \text{ times}
\]

Days’ sales in inventory = \(365 \div 1.4 = 260.71\)

For the prior year:

\[
\text{Inventory turnover ratio} = \frac{\$6,000,000}{\$4,000,000} = 1.5 \text{ times}
\]

Days’ sales in inventory = \(365 \div 1.5 = 243.33\)

Thus, there was an increase in days’ sales in inventory.

Anjuli’s receivables turnover ratio for the current year can be calculated as follows:

\[
\text{AR turnover} = \frac{\text{Net credit sales}}{\text{Ending receivable}} = \frac{\$11,000,000}{\$4,000,000} = 2.75 \text{ times}
\]

Days’ sales in receivables = \(365 \div 2.75 = 132.72\)

For the prior year:

\[
\text{AR turnover} = \frac{\$10,000,000}{\$3,000,000} = 3.33 \text{ times}
\]

Days’ sales in receivables = \(365 \div 3.33 = 109.5\)

Thus, days’ sales in receivables also increased.

- Answer (B) is incorrect because Days’ sales in receivables increased.
- Answer (C) is incorrect because Days’ sales in inventory increased.
- Answer (D) is incorrect because Both days’ sales in inventory and days’ sales in receivables increased.

[Fact Pattern #37]

For the year just ended, Beechwood Corporation had income from operations of $198,000 and net income of $96,000. The liabilities and shareholders’ equity section of Beechwood’s statement of financial position is shown below.

<table>
<thead>
<tr>
<th></th>
<th>January 1</th>
<th>December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$32,000</td>
<td>$84,000</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>14,000</td>
<td>11,000</td>
</tr>
<tr>
<td>7% bonds payable</td>
<td>95,000</td>
<td>77,000</td>
</tr>
<tr>
<td>Common stock ($10 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Reserve for bond retirement</td>
<td>12,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>155,000</td>
<td>206,000</td>
</tr>
<tr>
<td>Total liabilities and shareholders’ equity</td>
<td><strong>$608,000</strong></td>
<td><strong>$706,000</strong></td>
</tr>
</tbody>
</table>
(Refers to Fact Pattern #37)

Beechwood’s debt to equity ratio at year end is

A. 25.1%
B. 25.6%
C. 32.2%
D. 33.9%

- Answer (A) is incorrect because the debt to equity ratio is calculated by dividing year-end debt by year-end equity.
- Answer (B) is incorrect because the debt to equity ratio is calculated by dividing year-end debt by year-end equity.
- Answer (C) is correct. A firm’s debt to equity ratio is total debt divided by total stockholders’ equity.

\[
\text{Debt to equity} = \frac{($84,000 + $11,000 + $77,000)}{($300,000 + $28,000 + $206,000)}
\]
\[
= \frac{172,000}{534,000}
\]
\[
= 32.2\%
\]

- Answer (D) is incorrect because the percentage of 33.9 results from failing to include the reserve for bond retirement in total equity.

A debt to equity ratio is

A. About the same as the debt to assets ratio.
B. Higher than the debt to assets ratio.
C. Lower than the debt to assets ratio.
D. Not correlated with the debt to assets ratio.

- Answer (A) is incorrect because the ratios would always be different unless either debt or equity equaled zero.
- Answer (B) is correct. Because debt plus equity equals assets, a debt to equity ratio would have a lower denominator than a debt to assets ratio. Thus, the debt to equity ratio would be higher than the debt to assets ratio.
- Answer (C) is incorrect because the lower denominator in the debt to equity ratio means that it would always be higher than the debt to assets ratio.
- Answer (D) is incorrect because the two ratios are related in that they always move in the same direction.

The relationship of the total debt to the total equity of a corporation is a measure of

A. Liquidity.
B. Profitability.
C. Creditor risk.
D. Solvency.

- Answer (A) is incorrect because liquidity concerns how quickly cash can be made available to pay debts as they come due.
- Answer (B) is incorrect because the debt to equity ratio evaluates a company’s capital structure and is thus oriented toward the balance sheet. It does not measure the use (profits) made of assets.
Answer (C) is correct. The debt to equity ratio is a measure of risk to creditors. It indicates how much equity cushion is available to absorb losses before the interests of debt holders would be impaired. The less leveraged the company, the safer the creditors’ interests.

Answer (D) is incorrect because Solvency is the availability of assets to service debt. Technically, whenever the debt to equity ratio can be computed with a meaningful answer, it can be said that the firm is solvent because assets, by definition, have to exceed debts.

Everything else being equal, a <List A> highly leveraged firm will have <List B> earnings per share.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>More</td>
</tr>
<tr>
<td>B.</td>
<td>More</td>
</tr>
<tr>
<td>C.</td>
<td>Less</td>
</tr>
<tr>
<td>D.</td>
<td>Less</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td>Less volatile</td>
</tr>
<tr>
<td></td>
<td>Less volatile</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Higher leverage is associated with higher, not lower, EPS when sales exceed the breakeven point.
- Answer (B) is incorrect because Earnings per share is more volatile in more highly leveraged firms.
- Answer (C) is correct. Earnings per share is less volatile in less highly leveraged firms. Lower fixed costs result in less variable earnings when sales fluctuate.
- Answer (D) is incorrect because Less leverage is associated with lower, not higher, EPS when sales exceed the breakeven point.

If the ratio of total liabilities to equity increases, a ratio that must also increase is

A. Times interest earned.
B. Total liabilities to total assets.
C. Return on equity.
D. The current ratio.

- Answer (A) is incorrect because No determination can be made of the effect on interest coverage without knowing the amounts of income and interest expense.
- Answer (B) is correct. Because total assets will be the same as the sum of liabilities and equity, an increase in the liabilities to equity ratio will simultaneously increase the liabilities to assets ratio.
- Answer (C) is incorrect because The return on equity may be increased or decreased as a result of an increase in the liabilities to equity ratio.
- Answer (D) is incorrect because The current ratio equals current assets divided by current liabilities, and additional information is necessary to determine whether it would be affected. For example, an increase in current liabilities from short-term borrowing would increase the liabilities to equity ratio but decrease the current ratio.
Selected data from Ostrander Corporation’s financial statements for the years indicated are presented in thousands.

<table>
<thead>
<tr>
<th></th>
<th>Year 2 Operations</th>
<th>December 31</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Net credit sales</td>
<td>$4,175</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost of goods sold</td>
<td>2,880</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interest expense</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Income tax</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gain on disposal</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(net of tax)</td>
<td>950</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Net income</td>
<td>385</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cash</td>
<td></td>
<td>Year 2</td>
</tr>
<tr>
<td></td>
<td>Trading securities</td>
<td></td>
<td>169</td>
</tr>
<tr>
<td></td>
<td>Accounts receivable (net)</td>
<td></td>
<td>210</td>
</tr>
<tr>
<td></td>
<td>Merchandise inventory</td>
<td></td>
<td>440</td>
</tr>
<tr>
<td></td>
<td>Tangible fixed assets</td>
<td></td>
<td>480</td>
</tr>
<tr>
<td></td>
<td>Total assets</td>
<td>1,397</td>
<td>1,320</td>
</tr>
<tr>
<td></td>
<td>Current liabilities</td>
<td>370</td>
<td>368</td>
</tr>
<tr>
<td></td>
<td>Total liabilities</td>
<td>790</td>
<td>750</td>
</tr>
<tr>
<td></td>
<td>Common stock outstanding</td>
<td></td>
<td>226</td>
</tr>
<tr>
<td></td>
<td>Retained earnings</td>
<td>381</td>
<td>360</td>
</tr>
</tbody>
</table>

[221] (Refers to Fact Pattern #38)
The times interest earned ratio for Ostrander Corporation for Year 2 is

A. .57 times.
B. 7.70 times.
C. 3.50 times.
D. 6.90 times.

- Answer (A) is incorrect because this figure is the debt ratio.
- Answer (B) is incorrect because this figure is based on net income from operations after taxes and interest.
- Answer (C) is incorrect because this figure results from not adding interest and taxes to net income after the gain on disposal is subtracted.
- Answer (D) is correct. The interest coverage ratio is computed by dividing earnings before interest and taxes by interest expense. Net income of $385, minus the disposal gain of $210, is added to income taxes of $120 and interest expense of $50 to produce a ratio numerator of $345. Dividing $345 by $50 results in an interest coverage of 6.90 times.

[222] (Refers to Fact Pattern #38)
The total debt to equity ratio for Ostrander Corporation in Year 2 is

A. 3.49
B. 0.77
C. 2.07
D. 1.30

- Answer (A) is incorrect because total liabilities divided by common stock outstanding equals 3.49.
- Answer (B) is incorrect because equity divided by debt equals 0.77.
- Answer (C) is incorrect because total liabilities divided by retained earnings equals 2.07.
Answer (D) is correct. Total equity consists of the $226 of capital stock and $381 of retained earnings, or $607. Debt is given as the $790 of total liabilities. Thus, the ratio is 1.30 ($790 ÷ $607).

### [Fact Pattern #39]

Assume the following information pertains to Ramer Company, Matson Company, and for their common industry for a recent year.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Ramer</th>
<th>Matson</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current ratio</td>
<td>3.50</td>
<td>2.80</td>
<td>3.00</td>
</tr>
<tr>
<td>Accounts receivable turnover</td>
<td>5.00</td>
<td>8.10</td>
<td>6.00</td>
</tr>
<tr>
<td>Inventory turnover</td>
<td>6.20</td>
<td>8.00</td>
<td>6.10</td>
</tr>
<tr>
<td>Times interest earned</td>
<td>9.00</td>
<td>12.30</td>
<td>10.40</td>
</tr>
<tr>
<td>Debt to equity ratio</td>
<td>0.70</td>
<td>0.40</td>
<td>0.55</td>
</tr>
<tr>
<td>Return on investment</td>
<td>0.15</td>
<td>0.12</td>
<td>0.15</td>
</tr>
<tr>
<td>Dividend payout ratio</td>
<td>0.80</td>
<td>0.60</td>
<td>0.55</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>$3.00</td>
<td>$2.00</td>
<td>--</td>
</tr>
</tbody>
</table>

B. Which one of the following is correct if both companies have the same total assets and the same sales?

A. Ramer has more cash than Matson.
B. Ramer has fewer current liabilities than Matson.
C. Matson is more effectively using financial leverage.
D. Matson has a shorter operating cycle than Ramer.

- Answer (A) is incorrect because The amount of cash is not determinable from these facts.
- Answer (B) is incorrect because The amount of current liabilities is not determinable from these facts.
- Answer (C) is incorrect because Matson is not as highly leveraged, and no information is given about rate of return on shareholders’ equity.
- Answer (D) is correct. Ramer’s accounts receivable turnover and inventory turnover are much lower than Matson’s. Because Matson is collecting its receivables more quickly and holding inventory for a shorter time, it has a much shorter operating cycle than Ramer. Matson’s operating cycle is about 91.7 days [(365 ÷ 8.1) + (365 ÷ 8.0)]. Ramer’s operating cycle is about 131.2 days [(365 ÷ 5.0) + (365 ÷ 6.2)].

C. The attitudes of both Ramer and Matson concerning risk are best explained by the

A. Current ratio, accounts receivable turnover, and inventory turnover.
B. Dividend payout ratio and earnings per share.
C. Current ratio and earnings per share.
D. Debt to equity ratio and times interest earned.

- Answer (A) is incorrect because These are liquidity ratios that do not concern risk incurrence.
- Answer (B) is incorrect because EPS does not indicate management’s intent with respect to risk.
Answer (C) is incorrect because The current ratio and EPS are not indicators of the level of risk accepted.

Answer (D) is correct. Matson is the more conservative company because it is less highly leveraged (lower debt to equity ratio and a higher interest coverage). Moreover, it also pays out a smaller portion of its earnings in the form of dividends (lower dividend payout ratio). These ratios reflect management intent.

[225] (Refers to Fact Pattern #39)

Some of the ratios and data for Ramer and Matson are affected by income taxes. Assuming no interperiod income tax allocation, which of the following items would be directly affected by income taxes for the period?

A. Current ratio and debt to equity ratio.
B. Accounts receivable turnover and inventory turnover.
C. Return on investment and earnings per share.
D. Debt to equity ratio and dividend payout ratio.

- Answer (A) is incorrect because Neither ratio is based on net income.
- Answer (B) is incorrect because These turnover ratios are based on asset accounts and figures at the top of the income statement, not net income.
- Answer (C) is correct. Income taxes are an expense of the business and affect rates of return and earnings per share. Any ratio that uses net income as a part of the calculation is affected, e.g., return on investment, EPS, and dividend payout.
- Answer (D) is incorrect because The debt to equity ratio is not affected by taxes.

[226] A measure of long-term debt-paying ability is a company’s

A. Length of the operating cycle.
B. Return on assets.
C. Inventory turnover ratio.
D. Times interest earned ratio.

- Answer (A) is incorrect because The length of the operating cycle does not affect long-term debt-paying ability. By definition, long-term means longer than the normal operating cycle.
- Answer (B) is incorrect because Return on assets measures only how well management uses the assets that are available. It does not compare the return with debt service costs.
- Answer (C) is incorrect because The inventory turnover ratio is a measure of how well a company is managing one of its current assets.
- Answer (D) is correct. The times interest earned ratio is one measure of a firm’s ability to pay the interest on its debt obligations out of current earnings. This ratio equals earnings before interest and taxes divided by interest expense.
### Statement of Financial Position as of May 31

<table>
<thead>
<tr>
<th></th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$ 45</td>
<td>$ 38</td>
</tr>
<tr>
<td>Trading securities</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>68</td>
<td>48</td>
</tr>
<tr>
<td>Inventory</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>$255</td>
<td>$216</td>
</tr>
<tr>
<td>Investments, at equity</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>Property, plant, and equipment (net)</td>
<td>375</td>
<td>400</td>
</tr>
<tr>
<td>Intangible assets (net)</td>
<td>80</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$748</td>
<td>$691</td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$ 35</td>
<td>$ 18</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>70</td>
<td>42</td>
</tr>
<tr>
<td>Accrued expenses</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Income taxes payable</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td>$125</td>
<td>$ 80</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Deferred taxes</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>$163</td>
<td>$117</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred stock, 6%, $100 par value, cumulative</td>
<td>$150</td>
<td>$150</td>
</tr>
<tr>
<td>Common stock, $10 par value</td>
<td>225</td>
<td>195</td>
</tr>
<tr>
<td>Additional paid-in capital -- common stock</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>96</td>
<td>129</td>
</tr>
<tr>
<td><strong>Total equity</strong></td>
<td>$585</td>
<td>$574</td>
</tr>
<tr>
<td><strong>Total liabilities and equity</strong></td>
<td>$748</td>
<td>$691</td>
</tr>
</tbody>
</table>

### Income Statement for the year ended May 31

<table>
<thead>
<tr>
<th></th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net sales</strong></td>
<td>$480</td>
<td>$460</td>
</tr>
<tr>
<td><strong>Costs and expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs of goods sold</td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td>Selling, general, and administrative</td>
<td>52</td>
<td>51</td>
</tr>
<tr>
<td>Interest expense</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td><strong>Income before taxes</strong></td>
<td>$ 90</td>
<td>$ 85</td>
</tr>
<tr>
<td>Income taxes</td>
<td>36</td>
<td>34</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>$ 54</td>
<td>$ 51</td>
</tr>
</tbody>
</table>

---

[227] (Refers to Fact Pattern #40)
Devlin Company’s times interest earned ratio for the year ended May 31, Year 2, was

A. 6.75 times.
B. 11.25 times.
C. 12.25 times.
D. 18.75 times.

- Answer (A) is incorrect because this figure uses after-tax income in the numerator.
- Answer (B) is incorrect because this figure equals income before taxes divided by interest.
Answer (C) is correct. The times interest earned ratio equals income available to pay interest (net income + income taxes + interest expense) divided by interest expense. The ratio is therefore 12.25 \(\left(\frac{\$54 + \$36 + \$8}{\$8}\right)\).

Answer (D) is incorrect because this figure results from adding selling, general, and administrative expenses to the numerator.

**Fact Pattern #41**
The data presented below show actual figures for selected accounts of McKeon Company for the fiscal year ended May 31, Year 1, and selected budget figures for the Year 2 fiscal year. McKeon’s controller is in the process of reviewing the Year 2 budget and calculating some key ratios based on the budget. McKeon Company monitors yield or return ratios using the average financial position of the company. (Round all calculations to three decimal places if necessary.)

<table>
<thead>
<tr>
<th></th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$210,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Noncurrent assets</td>
<td>275,000</td>
<td>255,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>78,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>75,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Common stock ($30 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>32,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**Operations**

<table>
<thead>
<tr>
<th></th>
<th>Year 2 Operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales*</td>
<td>$350,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>160,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>3,000</td>
</tr>
<tr>
<td>Income taxes (40% rate)</td>
<td>48,000</td>
</tr>
<tr>
<td>Dividends declared and paid in Year 2</td>
<td>60,000</td>
</tr>
<tr>
<td>Administrative expense</td>
<td>67,000</td>
</tr>
</tbody>
</table>

*All sales are credit sales.

**Current Assets**

<table>
<thead>
<tr>
<th></th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 20,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>100,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>70,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>20,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**[228]** (Refers to Fact Pattern #41)

McKeon Company’s debt ratio for Year 2 is

A. 0.352  
B. 0.315  
C. 0.264  
D. 0.237

Answer (A) is incorrect because the debt ratio equals total debt at year-end divided by total assets at year-end.
Answer (B) is correct. The debt ratio is equal to the total debt at year-end divided by total assets at year-end. Total debt at year-end is $153,000 ($78,000 current liabilities + $75,000 long-term debt). Total assets equal $485,000 ($210,000 current assets + $275,000 noncurrent assets). Thus, the debt ratio is .315 ($153,000 ÷ $485,000).

Answer (C) is incorrect because the debt ratio equals total debt at year-end divided by total assets at year-end.

Answer (D) is incorrect because the debt ratio equals total debt at year-end divided by total assets at year-end.

---

**Refers to Fact Pattern #41**

**McKeon Company’s times interest earned ratio in Year 2 is**

A. 41  
B. 40  
C. 25  
D. 24

- Answer (A) is correct. The times interest earned ratio is equal to earnings before interest and taxes divided by interest expense. Earnings before interest and taxes is equal to $123,000 ($72,000 net income + $3,000 interest expense + $48,000 income taxes). The times interest earned ratio is therefore 41 ($123,000 ÷ $3,000 interest expense).
- Answer (B) is incorrect because the times interest earned ratio equals earnings before interest and taxes divided by interest expense.
- Answer (C) is incorrect because the times interest earned ratio equals earnings before interest and taxes divided by interest expense.
- Answer (D) is incorrect because the times interest earned ratio equals earnings before interest and taxes divided by interest expense.

---

**Refers to Fact Pattern #41**

**All of the following financial indicators are measures of liquidity and activity except the**

A. Average collection period in days.  
B. Merchandise inventory turnover.  
C. Accounts receivable turnover.  
D. Times interest earned ratio.

- Answer (A) is incorrect because Average collection period in days is an activity ratio.
- Answer (B) is incorrect because Merchandise inventory turnover is an activity ratio.
- Answer (C) is incorrect because Accounts receivable turnover is an activity ratio.
- Answer (D) is correct. Liquidity ratios measure a firm’s ability to pay its obligations in the short term and thus to continue operations. Examples include the current ratio and acid test (quick) ratio. Activity ratios measure the firm’s use of assets to generate revenue and income. Examples include inventory turnover, average collection period, and receivables turnover. Times interest earned is a ratio that measures the firm’s ability to cover its interest burden.

---

**Refers to Fact Pattern #41**

**A bondholder would be most concerned with which one of the following ratios?**

A. Inventory turnover.  
B. Times interest earned.  
C. Quick ratio.  
D. Earnings per share.
Answer (A) is incorrect because Inventory turnover is a measure of how well the firm manages inventory; it is not of immediate concern to a bondholder.

Answer (B) is correct. The times interest earned ratio is an income statement approach to evaluating a firm’s ongoing ability to meet the interest payments on its debt obligations. It equals earnings before interest and taxes divided by interest expense. A bondholder, being a creditor of the firm, would be most interested in how thoroughly the firm’s earnings cover the periodic interest payments on the bond.

Answer (C) is incorrect because The quick ratio is a measure of how well the firm’s current assets cover its current liabilities and is thus not the ratio of most interest to a bondholder.

Answer (D) is incorrect because Earnings per share is a baseline measure of how many dollars of net earnings can be assigned to a share of common stock and is thus of interest to an equity holder rather than a debt holder.

[232] A firm earned $10,000 before interest and taxes, has a 36% tax rate, and has the following debt outstanding:

<table>
<thead>
<tr>
<th>Debt Instrument</th>
<th>Principal (in $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First mortgage bond, 9.0%</td>
<td>5,000</td>
</tr>
<tr>
<td>Debenture, 10.2%</td>
<td>10,000</td>
</tr>
<tr>
<td>Subordinated bond, 12.0%</td>
<td>6,000</td>
</tr>
<tr>
<td>Total long-term debt</td>
<td>$21,000</td>
</tr>
</tbody>
</table>

The annual coverage of the firm’s debt is

A. 4.57 times.
B. 2.92 times.
C. 11.85 times.
D. 3.57 times.

Answer (A) is correct. The times interest earned (interest coverage) ratio is computed by dividing the income available for paying interest (pretax, pre-interest income) by the annual interest expense. The first step is to determine the annual interest expense:

\[
\begin{align*}
\text{First mortgage bond} & \times 9.0\% \times 5,000 = 450 \\
\text{Debenture} & \times 10.2\% \times 10,000 = 1,020 \\
\text{Subordinated bond} & \times 12.0\% \times 6,000 = 720 \\
\text{Total interest expense} & = 2,190
\end{align*}
\]

Dividing the pretax, pre-interest income of $10,000 by the $2,190 of interest expense produces an interest coverage ratio of 4.57.

Answer (B) is incorrect because After-tax, pre-interest income of $6,400 divided by the interest expense equals 2.92 times.

Answer (C) is incorrect because Pre-tax, pre-interest income should be divided by interest expense to find the times interest earned ratio.

Answer (D) is incorrect because Pre-tax, after-interest income ($7,810) divided by $2,190 equals 3.57 times.

[233] In general, as a company increases the amount of short-term financing relative to long-term financing, the

A. Greater the risk that it will be unable to meet principal and interest payments.
B. Leverage of the firm increases.
C. Likelihood of having idle liquid assets increases.
D. Current ratio increases.
Answer (A) is correct. An increase in the proportion of short-term financing will not affect a company's degree of leverage, but risk is increased because of the need for frequent refinancing. Because the debtor company will be forced to meet principal and interest payments quickly, perhaps before expected funds from a new project, the danger of default is increased. Also, future interest rates are difficult to predict.

Answer (B) is incorrect because Leverage is the use of borrowed funds to earn returns for stockholders. It is irrelevant whether the borrowed funds are long- or short-term.

Answer (C) is incorrect because The length of a loan does not affect the amount of liquid assets. Both long- and short-term loans result in liquid assets.

Answer (D) is incorrect because An increase in current liabilities decreases the current ratio.

[234] Which one of the following factors would likely cause a firm to increase its use of debt financing as measured by the debt to total capital ratio?

A. Increased economic uncertainty.
B. An increase in the degree of operating leverage.
C. An increase in the price-earnings ratio.
D. An increase in the corporate income tax rate.

Answer (A) is incorrect because Increased economic uncertainty makes equity financing more desirable. There is no legal mandate to make regular payments to equity holders.

Answer (B) is incorrect because Increased operating leverage (a greater degree of fixed production costs) increases risk. Hence, debt holders will require higher rates of interest. Higher interest costs will reduce the desirability of debt as a means of financing.

Answer (C) is incorrect because An increase in the price-earnings ratio makes equity financing less costly and more desirable. Hence, a given level of earnings will support a higher share price. In the Gordon growth model, the cost of equity capital declines when the share price increases.

Answer (D) is correct. Debt financing usually has a lower cost than equity financing because interest payments are tax deductible. If tax rates rise, debt becomes even more desirable because the tax shield becomes more valuable. The disadvantages of debt include the increase in fixed payments (interest). Thus, in an unstable economy, debt represents a greater risk to a firm than equity financing.
### RST Corporation Comparative Income Statements for the Years 5 and 6

<table>
<thead>
<tr>
<th></th>
<th>Year 6</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (all are credit)</td>
<td>$285,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>150,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$135,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
<td>65,000</td>
<td>36,000</td>
</tr>
<tr>
<td>Income before interest and income taxes</td>
<td>$70,000</td>
<td>$44,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Income before income taxes</td>
<td>$67,000</td>
<td>$41,000</td>
</tr>
<tr>
<td>Income tax expense</td>
<td>27,000</td>
<td>16,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$40,000</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

### RST Corporation
Comparative Balance Sheets
End of Years 5 and 6

<table>
<thead>
<tr>
<th></th>
<th>Year 6</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$5,000</td>
<td>$4,000</td>
</tr>
<tr>
<td>Short-term marketable investments</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>16,000</td>
<td>14,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>30,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$54,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>Noncurrent assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term investments</td>
<td>11,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Property, plant, and equipment</td>
<td>80,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Intangibles</td>
<td>3,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Total assets</td>
<td>$148,000</td>
<td>$125,000</td>
</tr>
</tbody>
</table>

| **Liabilities and Stockholders’ Equity** | | |
| Current liabilities: | | |
| Accounts payable | $11,000 | $7,000 |
| Accrued payables  | 1,000   | 1,000   |
| Total current liabilities | $12,000 | $8,000 |
| Long-term Liabilities: | | |
| 0% Bonds payable, due in Year 12 | 30,000 | 30,000 |
| Total liabilities | $42,000 | $38,000 |
| Stockholders’ equity: | | |
| Common stock, 2,400 shares, $10 par | $24,000 | $24,000 |
| Retained earnings | 82,000 | 63,000 |
| Total stockholders’ equity | $106,000 | $87,000 |
| Total liabilities and stockholders’ equity | $148,000 | $125,000 |

The market value of RST’s common stock at the end of Year Six was $100.00 per share.
RST’s times interest earned ratio at the end of Year 6 is

A. 23.33 times.  
B. 14.67 times.  
C. 14.33 times.  
D. 13.33 times.

- Answer (A) is correct. The formula for the times interest earned ratio is earnings before interest and taxes (EBIT) divided by interest expense. Interest was earned 23.33 times ($70,000 ÷ $3,000).
- Answer (B) is incorrect because the times interest earned ratio at the end of Year 5 equals 14.67.
- Answer (C) is incorrect because dividing the sum of the net income ($40,000) and the interest charges ($3,000) by the amount of interest charges ($3,000) results in 14.33 times, which is not a meaningful ratio.
- Answer (D) is incorrect because dividing net income ($40,000) by the interest charges ($3,000) results in 13.33 times, which is not a meaningful ratio.

Which of the outcomes represented in the following table would result from a company’s retirement of debt with excess cash?

<table>
<thead>
<tr>
<th>Following Period's</th>
<th>Total Assets Turnover Ratio</th>
<th>Times Interest Earned Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>B.</td>
<td>Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>C.</td>
<td>Decrease</td>
<td>Increase</td>
</tr>
<tr>
<td>D.</td>
<td>Decrease</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

- Answer (A) is correct. Because total assets will decline without any impact on sales, the total assets turnover ratio (sales ÷ total assets) will increase. In addition, a reduced debt level should cause a reduction in annual interest payments, so the times interest earned ratio [(net income + interest + taxes) ÷ interest] should increase.
- Answer (B) is incorrect because the times interest earned ratio will increase and the total assets turnover ratio will increase.
- Answer (C) is incorrect because the times interest earned ratio will increase and the total assets turnover ratio will increase.
- Answer (D) is incorrect because the times interest earned ratio will increase and the total assets turnover ratio will increase.

A company issued long-term bonds and used the proceeds to repurchase 40% of the outstanding shares of its stock. This financial transaction will likely cause the

A. Total assets turnover ratio to increase.  
B. Current ratio to decrease.  
C. Times interest earned ratio to decrease.  
D. Fixed charge coverage ratio to increase.

- Answer (A) is incorrect because the total assets turnover ratio is unaffected.
- Answer (B) is incorrect because the current ratio is unaffected.
Answer (C) is correct. The times interest earned ratio equals earnings before interest and taxes divided by interest expense. If bonds replace some equity in the capital structure, interest expense will increase by the same amount in both the numerator and denominator, which has the effect of reducing any ratio that exceeds 1.0. Moreover, income tax expense may decrease because interest is deductible.

Answer (D) is incorrect because the fixed charge coverage ratio will decrease.

Stanford Company leased some special-purpose equipment from Vincent, Inc., under a long-term lease that was treated as an operating lease by Stanford. After the financial statements for the year had been issued, it was discovered that the lease should have been treated as a capital lease by Stanford. All of the following measures relating to Stanford would be affected by this discovery except the

A. Debt/equity ratio.
B. Accounts receivable turnover.
C. Fixed asset turnover.
D. Net income percentage.

- Answer (A) is incorrect because the debt to equity ratio is affected by the long-term obligation represented by the capital lease.
- Answer (B) is correct. Whether the lease is classified as operating or capital, it represents an obligation on Stanford’s part. No receivable on Stanford’s books is involved.
- Answer (C) is incorrect because the fixed asset turnover ratio is affected by the capitalization of the lease.
- Answer (D) is incorrect because the net income percentage is affected by the amortization of the capital lease.

Which one of the following is the best indicator of long-term debt paying ability?

A. Working capital turnover.
B. Asset turnover.
C. Current ratio.
D. Debt to total assets ratio.

- Answer (A) is incorrect because working capital turnover is not recognized as a useful ratio.
- Answer (B) is incorrect because asset turnover measures a firm’s efficiency at deploying assets to generate sales revenue.
- Answer (C) is incorrect because the current ratio measures a firm’s ability to satisfy short-term, not long-term, debt obligations.
- Answer (D) is correct. The debt to total assets ratio is the best indicator of long-term debt paying ability. It measures the long-term debt burden carried by the company per dollar of assets.
The following information has been derived from the financial statements of Boutwell Company:

<table>
<thead>
<tr>
<th>Current assets</th>
<th>$640,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>990,000</td>
</tr>
<tr>
<td>Long-term liabilities</td>
<td>130,000</td>
</tr>
<tr>
<td>Current ratio</td>
<td>3.2</td>
</tr>
</tbody>
</table>

The company’s debt to equity ratio is

A. 0.50  
B. 0.37  
C. 0.33  
D. 0.13

- Answer (A) is correct. Boutwell’s current liabilities are $200,000 ($640,000 ÷ 3.2). Thus, its total debt load is $330,000 ($200,000 + $130,000) and its total equity is $660,000 ($990,000 – $330,000). Therefore, Boutwell’s debt to equity ratio is 0.50 to 1 ($330,000 ÷ $660,000).
- Answer (B) is incorrect because Total debt would be $330,000 and equity would be $660,000.
- Answer (C) is incorrect because A ratio of 0.33 results from improperly dividing total liabilities by total assets instead of total equity.
- Answer (D) is incorrect because A ratio of 0.13 results from dividing only long-term liabilities, instead of total liabilities, by total assets, instead of net assets.

The interest expense for a company is equal to its earnings before interest and taxes (EBIT). The company’s tax rate is 40%. The company’s times interest earned ratio is equal to

A. 2.0  
B. 1.0  
C. 0.6  
D. 1.2

- Answer (A) is incorrect because The times interest earned ratio equals EBIT divided by interest expense. If numerator and denominator are equal, the ratio is 1.
- Answer (B) is correct. The times interest earned ratio equals EBIT divided by interest expense. If numerator and denominator are equal, the ratio is 1.
- Answer (C) is incorrect because The times interest earned ratio equals EBIT divided by interest expense. If numerator and denominator are equal, the ratio is 1.
- Answer (D) is incorrect because The times interest earned ratio equals EBIT divided by interest expense. If numerator and denominator are equal, the ratio is 1.
[Fact Pattern #43]
The data presented below show actual figures for selected accounts of McKeon Company for the fiscal year ended May 31, Year 1, and selected budget figures for the Year 2 fiscal year. McKeon’s controller is in the process of reviewing the Year 2 budget and calculating some key ratios based on the budget. McKeon Company monitors yield or return ratios using the average financial position of the company. (Round all calculations to three decimal places if necessary.)

<table>
<thead>
<tr>
<th></th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$210,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Noncurrent assets</td>
<td>275,000</td>
<td>255,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>78,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>75,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Common stock ($30 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>32,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

Year 2
Operations
Sales* $350,000
Cost of goods sold 160,000
Interest expense 3,000
Income taxes (40% rate) 48,000
Dividends declared and paid in Year 2 60,000
Administrative expense 67,000

*All sales are credit sales.

[242] (Refers to Fact Pattern #43)
The degree of financial leverage to be employed by McKeon Company in Year 2 is

A. 1.640
B. 1.600
C. 1.025
D. 0.600

- Answer (A) is incorrect because the degree of financial leverage may be restated as EBIT divided by EBIT minus interest, given no preferred stock.
- Answer (B) is incorrect because the degree of financial leverage may be restated as EBIT divided by EBIT minus interest, given no preferred stock.
- Answer (C) is correct. The degree of financial leverage for a reporting period equals earnings before interest and taxes (EBIT) divided by earnings before taxes (EBT). McKeon’s can be calculated as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$350,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>(160,000)</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>(67,000)</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>$123,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>(3,000)</td>
</tr>
<tr>
<td><strong>EBT</strong></td>
<td>$120,000</td>
</tr>
<tr>
<td>Income taxes</td>
<td>(48,000)</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>$72,000</td>
</tr>
</tbody>
</table>

\[
\text{DFL} = \frac{\text{EBIT}}{\text{EBT}} = \frac{123,000}{120,000} = 1.025
\]

- Answer (D) is incorrect because the degree of financial leverage may be restated as EBIT divided by EBIT minus interest, given no preferred stock.

\[\text{DOL} = A\text{ measure of the change in earnings available to common stockholders associated with a given change in operating earnings.} \]

- A. A measure of the change in operating income resulting from a given change in sales.
- B. Lower if the degree of total leverage is higher, other things held constant.
- C. Higher if the degree of total leverage is lower, other things held constant.

- Answer (A) is incorrect because the degree of financial leverage is a measure of the change in earnings available to common stockholders associated with a given change in operating earnings.
- Answer (B) is correct. The degree of operating leverage (DOL) is a measure of the change in operating income (or EBIT) associated with a given change in sales volume. Operating leverage arises from a high level of plant and machinery (i.e., fixed costs) in the production process.
- Answer (C) is incorrect because the degree of total leverage is the multiple of the degree of operating leverage and the degree of financial leverage. Other things being equal, DOL is higher if the degree of total leverage is higher.
- Answer (D) is incorrect because the degree of total leverage is the multiple of the degree of operating leverage and the degree of financial leverage. Other things being equal, DOL is higher if the degree of total leverage is higher.

- For a firm with a degree of operating leverage of 3.5, an increase in sales of 6% will

- A. Increase pre-tax profits by 3.5%.
- B. Increase pre-tax profits by 21%.
- D. Increase pre-tax profits by 1.71%.

- Answer (A) is incorrect because the 3.5 is multiplied times the increase in sales.
- Answer (B) is incorrect because a firm with operating leverage will experience a rise in pre-tax profits when sales increase.
- Answer (C) is correct. A degree of operating leverage (DOL) of 3.5 means that operating income (EBIT) will increase 3.5 times greater than any sales increase. Multiplying 3.5 times the 6% sales increase results in a pre-tax profit increase of 21%.
- Answer (D) is incorrect because the DOL is multiplied by the sales change, not divided into it.
This year, Nelson Industries increased earnings before interest and taxes (EBIT) by 17%. During the same period, net income after tax increased by 42%. The degree of financial leverage that existed during the year is

A. 1.70
B. 4.20
C. 2.47
D. 5.90

- Answer (A) is incorrect because The degree of financial leverage is calculated by dividing the percentage change in net income by the percentage change in EBIT.
- Answer (B) is incorrect because The degree of financial leverage is calculated by dividing the percentage change in net income by the percentage change in EBIT.
- Answer (C) is correct. The percentage-change version of the degree of financial leverage equals the percentage change in net income over the percentage change in EBIT. Accordingly, Nelson’s degree of financial leverage is 2.47 \(\frac{42\%}{17\%}\).
- Answer (D) is incorrect because The degree of financial leverage is calculated by dividing the percentage change in net income by the percentage change in EBIT.

A firm with a higher degree of operating leverage when compared to the industry average implies that the

A. Firm has higher variable costs.
B. Firm’s profits are more sensitive to changes in sales volume.
C. Firm is more profitable.
D. Firm is less risky.

- Answer (A) is incorrect because A firm with higher operating leverage has higher fixed costs and lower variable costs.
- Answer (B) is correct. Operating leverage is a measure of the degree to which fixed costs are used in the production process. A company with a higher percentage of fixed costs (higher operating leverage) has greater risk than one in the same industry that relies more heavily on variable costs. However, such a firm is also able to expand production rapidly in times of higher product demand. Thus, the more leveraged a firm is in its operations, the more sensitive operating income is to changes in sales volume.
- Answer (C) is incorrect because A firm with higher leverage will be relatively more profitable than a firm with lower leverage when sales are high. The opposite is true when sales are low.
- Answer (D) is incorrect because A firm with higher leverage is more risky. Its reliance on fixed costs is greater.
A summary of the income statement of Sahara Company is shown below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>(9,000,000)</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>(3,000,000)</td>
</tr>
<tr>
<td>Interest expense</td>
<td>(800,000)</td>
</tr>
<tr>
<td>Taxes</td>
<td>(880,000)</td>
</tr>
</tbody>
</table>

Based on the above information, Sahara’s degree of financial leverage is

A. 0.96  
B. 1.36  
C. 1.61  
D. 2.27

- **Answer (A)** is incorrect because the degree of financial leverage is calculated by dividing earnings before interest and taxes by earnings before taxes.
- **Answer (B)** is correct. The degree of financial leverage (DFL) equals earnings before interest and taxes (EBIT) divided by earnings before taxes. Sahara’s DFL can be calculated as follows:

\[
\begin{align*} 
\text{Sales} & = 15,000,000 \\
\text{Cost of goods sold} & = 9,000,000 \\
\text{Operating expenses} & = 3,000,000 \\
\text{EBIT} & = 3,000,000 \\
\text{Interest expense} & = 800,000 \\
\text{Earnings before taxes} & = 2,200,000 \\
\text{Taxes} & = 880,000 \\
\text{Net income} & = 1,320,000 \\
\end{align*}
\]

\[
\text{DFL} = \frac{\text{EBIT}}{\text{Earnings before taxes}} = \frac{3,000,000}{2,200,000} = 1.36
\]

- **Answer (C)** is incorrect because the degree of financial leverage is calculated by dividing earnings before interest and taxes by earnings before taxes.
- **Answer (D)** is incorrect because the figure 2.27 results from improperly using net income in the denominator.

A degree of operating leverage of 3 at 5,000 units means that a

A. 3% change in earnings before interest and taxes will cause a 3% change in sales.  
B. 3% change in sales will cause a 3% change in earnings before interest and taxes.  
C. 1% change in sales will cause a 3% change in earnings before interest and taxes.  
D. 1% change in earnings before interest and taxes will cause a 3% change in sales.

- **Answer (A)** is incorrect because changes in EBIT are caused by changes in sales, not the other way around.  
- **Answer (B)** is incorrect because a change in sales resulting in an equal change in EBIT would only result from a degree of operating leverage of 1.
Answer (C) is correct. The degree of operating leverage (DOL) is the multiple of contribution margin over operating income (also called earnings before interest and taxes, or EBIT). A high multiple indicates heavy use of fixed costs in the firm’s operations. This firm’s contribution margin is 3 times EBIT. Thus, a given percentage change in sales will result in a change 3 times as great in EBIT.

Answer (D) is incorrect because Changes in EBIT are caused by changes in sales, not the other way around.

[F249] Firms with high degrees of financial leverage would be best characterized as having

A. High debt-to-equity ratios.
B. Zero coupon bonds in their capital structures.
C. Low current ratios.
D. High fixed-charge coverage.

Answer (A) is correct. The degree of financial leverage (DFL) is the multiple of operating income (or earnings before interest and taxes, called EBIT) over earnings before taxes (EBT). A high multiple indicates heavy use of fixed costs in the firm’s capital structure, revealed by high interest payments on debt.

Answer (B) is incorrect because Zero coupon bonds have no periodic distribution for interest, resulting in a relatively low degree of financial leverage.

Answer (C) is incorrect because A highly leveraged firm would tend to have interest payments coming due routinely, resulting in relatively high current liabilities and consequent low current ratios.

Answer (D) is incorrect because A highly leveraged firm has, by definition, a high level of fixed charges, and so will find it difficult to tie up enough cash to consistently cover these charges.

[F250] The use of debt in the capital structure of a firm

A. Increases its financial leverage.
B. Increases its operating leverage.
C. Decreases its financial leverage.
D. Decreases its operating leverage.

Answer (A) is correct. Financial leverage is the use of fixed costs in a firm’s capital structure, indicated by high interest payments on debt. These increased fixed costs (and accompanying lowered variable costs) make profitable periods more profitable and unprofitable periods worse.

Answer (B) is incorrect because Operating leverage is affected by the use of fixed costs in the production process, not the capital structure.

Answer (C) is incorrect because The fixed costs associated with the use of debt increase financial leverage.

Answer (D) is incorrect because Operating leverage is affected by the use of fixed costs in the production process, not the capital structure.

[F251] A financial analyst with Mineral, Inc., calculated the company’s degree of financial leverage as 1.5. If income before interest increases by 5%, earnings to shareholders will increase by

A. 1.50%
B. 3.33%
C. 5.00%
D. 7.50%
Answer (A) is incorrect because the percentage of 1.5 results from equating the degree of financial leverage with its effect on net earnings.

Answer (B) is incorrect because the percentage of 3.33 results from improperly identifying the difference between EBIT before the increase and EBIT after the increase (7.5% − 5% = 2.5%) as the numerator to determine the degree of the effect (2.5% ÷ 7.5% = 3.33%).

Answer (C) is incorrect because five percent results from equating the amount of the increase in EBIT with its effect on net earnings.

Answer (D) is correct. The degree of financial leverage (DFL) is the multiple of operating income (or earnings before interest and taxes, called EBIT) over earnings before taxes (EBT). A high multiple indicates heavy use of fixed costs in the firm’s capital structure, revealed by high interest payments on debt. This firm’s EBIT is 1.5 times EBT. Thus, a given percentage change in EBIT will result in a change one-and-a-half times as great in EBT (1.5 × 5% = 7.5%).

Which one of the following statements concerning the effects of leverage on earnings before interest and taxes (EBIT) and earnings per share (EPS) is correct?

A. For a firm using debt financing, a decrease in EBIT will result in a proportionally larger decrease in EPS.
B. A decrease in the financial leverage of a firm will increase the beta value of the firm.
C. If Firm A has a higher degree of operating leverage than Firm B and Firm A offsets this by using less financial leverage, then both firms will have the same variability in EBIT.
D. Financial leverage affects both EPS and EBIT, while operating leverage only affects EBIT.

Answer (A) is correct. Debt financing increases a firm’s financial leverage, that is, the high fixed charges that accompany the legal obligation to pay interest to debtholders makes the firm riskier. These high fixed costs make profitable periods more profitable and unprofitable periods worse. Thus, a given decrease in EBIT will result in a proportionally larger decrease in EPS.

Answer (B) is incorrect because the beta value of a firm’s stock is dependent on its relationship to the rest of the market, not the firm’s financial leverage.

Answer (C) is incorrect because financial leverage (i.e., interest expense) impacts the income statement after EBIT.

Answer (D) is incorrect because any income statement item that affects EBIT necessarily affects EPS as well.
Financial information for Arbat, Inc., for 2 years of operation is shown below.

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$4,000,000</td>
<td>$4,400,000</td>
</tr>
<tr>
<td>Total operating costs</td>
<td>$3,200,000</td>
<td>$3,440,000</td>
</tr>
<tr>
<td>Earnings before interest and taxes</td>
<td>$800,000</td>
<td>$960,000</td>
</tr>
<tr>
<td>Interest payments</td>
<td>$320,000</td>
<td>$275,000</td>
</tr>
<tr>
<td>Income taxes</td>
<td>$245,000</td>
<td>$354,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$235,000</td>
<td>$331,000</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>$2.35</td>
<td>$3.31</td>
</tr>
</tbody>
</table>

The degree of operating leverage (DOL) for Arbat, Inc., is

A. 4.09
B. 2.67
C. 2.00
D. 0.75

- Answer (A) is incorrect because the percentage-change version of DOL measures the changes in income statement amounts from one period to another. This can be expressed as the percentage change in EBIT over the percentage change in sales. The amount of 4.09 incorrectly uses the percentage change in net income instead of the percentage change in EBIT.
- Answer (B) is incorrect because the percentage-change version of DOL measures the changes in income statement amounts from one period to another. This can be expressed as the percentage change in EBIT over the percentage change in sales. The amount of 2.67 incorrectly calculates DOL by dividing the percentage change in sales by the percentage change in total operating costs.
- Answer (C) is correct. The percentage-change version of DOL measures the changes in income statement amounts from one period to another. This can be expressed as the percentage change in EBIT over the percentage change in sales. The percentage change in EBIT is equal to 20% \([($960,000 – $800,000) ÷ $800,000]\). The percentage change in sales is equal to 10% \([($4,400,000 – $4,000,000) ÷ $4,000,000]\). Therefore, the DOL for Arbat is equal to 2.00 (20% ÷ 10%).
- Answer (D) is incorrect because the percentage-change version of DOL measures the changes in income statement amounts from one period to another. This can be expressed as the percentage change in EBIT over the percentage change in sales. The amount of 0.75 incorrectly uses the percentage change in total operating costs instead of the percentage change in EBIT.

Since incorporating 3 years ago, Lawrence, Inc., has estimated bad debts at a rate of 3% using the income statement approach. During its fourth year in business, after recording the uncollectible accounts expense based on its previous estimate, Lawrence determined that its estimate of bad debts should be increased to 4.5%. During this fourth year, Lawrence recorded sales of $25,000,000 and had an ending accounts receivable balance of $2,000,000. This change would decrease

A. Both operating leverage and times interest earned.
B. The current year’s income by $1,125,000 and decrease the firm’s operating leverage.
C. The current year’s income by $375,000 and increase the firm’s operating leverage.
D. The current year’s income by $30,000 and decrease the firm’s financial leverage.

- Answer (A) is incorrect because the times-interest-earned ratio is decreased. However, operating leverage would increase, not decrease.
- Answer (B) is incorrect because the current-year income would decrease by the difference between the bad debt expense previously recorded and the new estimate.
- Answer (C) is correct. Lawrence increased its bad debt expense by 1.5% for the current year. This increase would cause a decrease in income of $375,000 [25,000,000 \times (4.5\% - 3\%)]. Because Lawrence used the income statement approach of calculating bad debts, the accounts receivable balance of $2,000,000 is irrelevant. This decrease in income will cause both the numerator (contribution margin) and the denominator (operating income) of the firm’s operating leverage to decrease by a proportional amount. However, this proportional decrease will cause the overall leverage to increase.
- Answer (D) is incorrect because Lawrence used the income statement approach to calculate bad debt expense. This option incorrectly multiplies the difference in bad debt estimates by the ending accounts receivable balance instead of using the revenues.

[Fact Pattern #44]
The financial statements for Dividendosaurus, Inc., for the current year are as follows:

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>Statement of Income and Retained Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>Sales</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>Cost of goods sold</td>
</tr>
<tr>
<td>Inventory</td>
<td>Gross profit</td>
</tr>
<tr>
<td>Net fixed assets</td>
<td>Operations expenses</td>
</tr>
<tr>
<td>Total</td>
<td>Operating income</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>Interest expense</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>Income before tax</td>
</tr>
<tr>
<td>Capital stock</td>
<td>Income tax</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>Net income</td>
</tr>
<tr>
<td>Total</td>
<td>Add: Jan. 1 retained earnings</td>
</tr>
<tr>
<td></td>
<td>Less: dividends</td>
</tr>
<tr>
<td></td>
<td>Dec. 31 retained earnings</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[255] (Refers to Fact Pattern #44)
Dividendosaurus has return on assets of

A. 21.1%
B. 39.2%
C. 42.1%
D. 45.3%

- Answer (A) is correct. The return on assets is the ratio of net income to total assets. For Dividendosaurus, it equals 21.1\% ($200 net income ÷ $950 total assets).
- Answer (B) is incorrect because the ratio of net income to common equity is 39.2\%.
- Answer (C) is incorrect because the ratio of income before tax to total assets is 42.1\%.
- Answer (D) is incorrect because the ratio of income before interest and tax to total assets is 45.3\%.
Dividendosaurus has a profit margin of

A. 6.67%
B. 13.33%
C. 14.33%
D. 46.67%

- **Answer (A) is correct.** The profit margin is the ratio of net income to sales. For Dividendosaurus, it equals 6.67% ($200 net income ÷ $3,000 sales).
- **Answer (B) is incorrect because** the ratio of income before tax to sales is 13.33%.
- **Answer (C) is incorrect because** the ratio of income before interest and taxes to sales is 14.33%.
- **Answer (D) is incorrect because** the ratio of gross profit to sales is 46.67%.

In the current year, Griffin, Inc., had $15 million in sales, while total fixed costs were held to $6 million. The firm’s total assets at year end were $20 million and the debt/equity ratio was calculated at 0.60. If the firm’s EBIT is $3 million, the interest on all debt is 9%, and the tax rate is 40%, what is the firm’s return on equity?

A. 11.16%
B. 14.4%
C. 18.6%
D. 24.0%

- **Answer (A) is correct.** The first step is to determine the amount of equity. If the debt/equity ratio is .6, then the calculation is .6E + E = $20 million. Thus, E (equity) equals $12.5 million. Debt is therefore $7.5 million. At 9%, interest on $7.5 million of debt is $675,000. Earnings before taxes are $2,325,000 ($3,000,000 EBIT – $675,000 interest). At a 40% tax rate, taxes are $930,000, which leaves a net income of $1,395,000. Return on equity is calculated by dividing the $1,395,000 by the $12,500,000 of equity capital, giving an ROE of 11.16%.
- **Answer (B) is incorrect because** a failure to deduct interest expense results in 14.4%.
- **Answer (C) is incorrect because** a failure to deduct income taxes results in 18.6%.
- **Answer (D) is incorrect because** using the wrong amount of equity results in 24.0%.

White Knight Enterprises is experiencing a growth rate of 9% with a return on assets of 12%. If the debt ratio is 36% and the market price of the stock is $38 per share, what is the return on equity?

A. 7.68%
B. 9.0%
C. 12.0%
D. 18.75%

- **Answer (A) is incorrect because** this percentage is based on 64% of the ROA.
- **Answer (B) is incorrect because** this percentage is the growth rate, not a return.
- **Answer (C) is incorrect because** this percentage is the return on assets, not return on equity.
- **Answer (D) is correct.** Assume that the firm has $100 in assets, with debt of $36 and equity of $64. Income (return) is $12. The $12 return on assets equates to an 18.75% return on equity ($12 ÷ $64).
The data presented below show actual figures for selected accounts of McKeon Company for the fiscal year ended May 31, Year 1, and selected budget figures for the Year 2 fiscal year. McKeon’s controller is in the process of reviewing the Year 2 budget and calculating some key ratios based on the budget. McKeon Company monitors yield or return ratios using the average financial position of the company. (Round all calculations to three decimal places if necessary.)

<table>
<thead>
<tr>
<th>Current assets</th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noncurrent assets</td>
<td>275,000</td>
<td>255,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>78,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>75,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Common stock ($30 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>32,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operations</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales*</td>
<td>$350,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>160,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>3,000</td>
</tr>
<tr>
<td>Income taxes (40% rate)</td>
<td>48,000</td>
</tr>
<tr>
<td>Dividends declared and paid in Year 2</td>
<td>60,000</td>
</tr>
<tr>
<td>Administrative expense</td>
<td>67,000</td>
</tr>
</tbody>
</table>

*All sales are credit sales.

<table>
<thead>
<tr>
<th>Current Assets</th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 20,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>100,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>70,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>20,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

The Year 2 return on equity for McKeon Company is

A. 0.040
B. 0.221
C. 0.240
D. 0.361

- Answer (A) is incorrect because Return on equity equals net income divided by average stockholders’ equity.
- Answer (B) is correct. Return on equity equals net income of $72,000 ($350,000 sales – $160,000 COGS – $3,000 interest expense – $48,000 taxes – $67,000 administrative expenses) divided by the average stockholders’ equity (yield or return ratios are based on average financial position in these questions). The average equity of $326,000 is found by averaging the $320,000 sum of the common stock and retained earnings at May 31, Year 1, with the $332,000 ending balance. Dividing the $72,000 net income by $326,000 produces a rate of return of 22.1%.
- Answer (C) is incorrect because Return on equity equals net income divided by average stockholders’ equity.
- Answer (D) is incorrect because Return on equity equals net income divided by average stockholders’ equity.
In Year 3, Newman Manufacturing’s gross profit margin remained unchanged from Year 2. But, in Year 3, the company’s net profit margin declined from the level reached in Year 2. This could have happened because, in Year 3,

A. Corporate tax rates increased.
B. Cost of goods sold increased relative to sales.
C. Sales increased at a faster rate than operating expenses.
D. Common share dividends increased.

- Answer (A) is correct. Gross profit margin is net sales minus cost of goods sold. Net profit margin is gross profit margin minus all remaining expenses and losses, one of which is income taxes. If corporate tax rates increased, net profit margin would decrease, leaving gross profit margin unchanged.
- Answer (B) is incorrect because a change in cost of goods sold would have affected gross profit margin.
- Answer (C) is incorrect because sales increasing faster than operating expenses would have resulted in an increase, not a decrease, to net profit margin.
- Answer (D) is incorrect because any impact on dividends cannot be determined from the information given.

Colonie, Inc., expects to report net income of at least $10 million annually for the foreseeable future. Colonie could increase its return on equity by taking which of the following actions with respect to its inventory turnover and the use of equity financing?

<table>
<thead>
<tr>
<th>Inventory Turnover</th>
<th>Use of Equity Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Increase</td>
<td>Increase</td>
</tr>
<tr>
<td>B. Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>C. Decrease</td>
<td>Increase</td>
</tr>
<tr>
<td>D. Decrease</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because increasing equity financing raises the denominator, lowering the overall return on equity ratio.
- Answer (B) is correct. Return on equity, in the most general terms, is the ratio of net income to total equity. Increasing inventory turnover raises the numerator, and decreasing equity financing lowers the denominator. This combination is thus the only effective means of increasing return on equity.
- Answer (C) is incorrect because decreasing inventory turnover lowers the numerator, lowering the overall return on equity ratio.
- Answer (D) is incorrect because decreasing inventory turnover lowers the numerator, lowering the overall return on equity ratio.
**Statement of Financial Position as of May 31**  
(in thousands)  
<table>
<thead>
<tr>
<th></th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$45</td>
<td>$38</td>
</tr>
<tr>
<td>Trading securities</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>68</td>
<td>48</td>
</tr>
<tr>
<td>Inventory</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>PrepaMed expenses</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$255</td>
<td>$216</td>
</tr>
<tr>
<td>Investments, at equity</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>Property, plant, and equipment (net)</td>
<td>375</td>
<td>400</td>
</tr>
<tr>
<td>Intangible assets (net)</td>
<td>80</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$748</td>
<td>$691</td>
</tr>
<tr>
<td><strong>Liabilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$35</td>
<td>$18</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>70</td>
<td>42</td>
</tr>
<tr>
<td>Accrued expenses</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Income taxes payable</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$125</td>
<td>$80</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Deferred taxes</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>$163</td>
<td>$117</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferred stock, 6%, $100 par value, cumulative</td>
<td>$150</td>
<td>$150</td>
</tr>
<tr>
<td>Common stock, $10 par value</td>
<td>225</td>
<td>195</td>
</tr>
<tr>
<td>Additional paid-in capital -- common stock</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>96</td>
<td>129</td>
</tr>
<tr>
<td><strong>Total equity</strong></td>
<td>$585</td>
<td>$574</td>
</tr>
<tr>
<td><strong>Total liabilities and equity</strong></td>
<td>$748</td>
<td>$691</td>
</tr>
</tbody>
</table>

**Income Statement for the year ended May 31**  
(in thousands)  
<table>
<thead>
<tr>
<th></th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net sales</strong></td>
<td>$480</td>
<td>$460</td>
</tr>
<tr>
<td>Costs and expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs of goods sold</td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td>Selling, general, and administrative</td>
<td>52</td>
<td>51</td>
</tr>
<tr>
<td>Interest expense</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Income before taxes</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>Income taxes</td>
<td>36</td>
<td>34</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>$54</td>
<td>$51</td>
</tr>
</tbody>
</table>

[Fact Pattern #46]  
The information below pertains to Devlin Company.

Devlin Company’s rate of return on assets for the year ended May 31, Year 2, was

A.  7.2%  
B.  7.5%  
C.  7.8%  
D.  11.3%

- Answer (A) is incorrect because The figure of 7.2% uses ending total assets instead of average total assets.
Answer (B) is correct. The rate of return on assets equals net income divided by average total assets. Accordingly, the rate of return is 7.5% \( \frac{554}{[(748 + 691) / 2]} \).

Answer (C) is incorrect because Net income divided by beginning total assets equals 7.8%.

Answer (D) is incorrect because The return on sales is 11.3%.

**[Fact Pattern #47]**

For the year just ended, Beechwood Corporation had income from operations of $198,000 and net income of $96,000. The liabilities and shareholders’ equity section of Beechwood’s statement of financial position is shown below.

<table>
<thead>
<tr>
<th></th>
<th>January 1</th>
<th>December 31</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$32,000</td>
<td>$84,000</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>14,000</td>
<td>11,000</td>
</tr>
<tr>
<td>7% bonds payable</td>
<td>95,000</td>
<td>77,000</td>
</tr>
<tr>
<td>Common stock ($10 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Reserve for bond retirement</td>
<td>12,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>155,000</td>
<td>206,000</td>
</tr>
<tr>
<td>Total liabilities and shareholders’ equity</td>
<td>$608,000</td>
<td>$706,000</td>
</tr>
</tbody>
</table>

[263] (Refers to Fact Pattern #47)

Beechwood’s return on shareholders’ equity for the year just ended is

A. 19.2%
B. 19.9%
C. 32.0%
D. 39.5%

Answer (A) is correct. Return on equity consists of net income divided by total equity. Since the numerator is derived from the income statement, the balance sheet accounts in the denominator must be averaged. Beechwood’s return is thus calculated as follows:

\[
\text{ROE} = \frac{96,000}{\left(\frac{(300,000 + 300,000)}{2}\right)} + \frac{(12,000 + 28,000)}{2} + \frac{(155,000 + 206,000)}{2} \\
= \frac{96,000}{(300,000 + 20,000 + 180,500)} \\
= \frac{96,000}{500,500} \\
= 0.1918
\]

Answer (B) is incorrect because This percentage results from failing to include the reserve for bond retirement in total equity.

Answer (C) is incorrect because This percentage results from failing to include the reserve for bond retirement and retained earnings in the denominator.

Answer (D) is incorrect because This percentage results from improperly using income from operations rather than net income in the numerator.
The president of Reading Manufacturing, Inc., is establishing performance goals for each of the company’s manufacturing plants. The data below represent prior-year results for one of the plants.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$400,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>100,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>200,000</td>
</tr>
<tr>
<td>Average assets</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Average liabilities</td>
<td>200,000</td>
</tr>
</tbody>
</table>

The plant’s return on assets is

A. 37.5%
B. 30.0%
C. 12.5%
D. 10.0%

Answer (A) is incorrect because Return on assets is calculated as net income over average total assets. Net income is equal to revenues less variable and fixed expenses. This answer choice fails to subtract fixed costs when calculating net income. In addition, it incorrectly subtracts average liabilities from average assets to calculate the denominator. Please note that the average assets are given and do not need to be adjusted for liabilities.

Answer (B) is incorrect because Return on assets is calculated as net income over average total assets. Net income is equal to revenues less variable and fixed expenses. This answer choice fails to subtract fixed costs when calculating net income.

Answer (C) is incorrect because Return on assets is calculated as net income over average total assets. This answer choice incorrectly subtracts average liabilities from average assets to calculate the denominator. Please note that the average assets are given and do not need to be adjusted for liabilities.

Answer (D) is correct. Return on assets is calculated as net income over average total assets. Net income for Reading Manufacturing is equal to $100,000 ($400,000 revenues – $100,000 variable costs – $200,000 fixed costs). Average total assets is stated as $1,000,000. Thus, return on assets is equal to 10.0% ($100,000 ÷ $1,000,000).

Acme Company has sales of $100,000, cost of sales of $40,000, interest expense of $4,000, taxes of $18,000, and operating expenses of $15,000. What is Acme’s operating profit margin?

A. 60%
B. 45%
C. 41%
D. 23%

Answer (A) is incorrect because Operating profit margin is equal to operating income divided by net sales. Operating income includes COGS and operating expenses but not interest or taxes. The amount of 60% fails to subtract the operating expenses of $15,000 from the net sales in order to calculate the correct operating income of $45,000.

Answer (B) is correct. Operating profit margin is equal to operating income divided by net sales. Operating income includes COGS and operating expenses but not interest or taxes. Thus, Acme’s operating income is equal to $45,000 ($100,000 sales – $40,000 COGS – $15,000 operating expenses). The amount of $45,000 divided by $100,000 of net sales results in an operating profit margin of 45%.

Answer (C) is incorrect because Operating profit margin is equal to operating income divided by net sales. Operating income includes COGS and operating expenses but not interest or taxes. The amount of 41% of 41% incorrectly includes the interest expense in the operating income calculation.

Answer (D) is incorrect because Operating profit margin is equal to operating income divided by net sales. Operating income includes COGS and operating expenses but not interest or taxes. The amount of 23% incorrectly includes the interest expense and the taxes in the operating income calculation.
The following information pertains to Andrew Co. for the year ended December 31:

Sales $720,000  
Net income 120,000  
Average total assets 480,000

Which one of the following formulas depicts the use of the DuPont model to calculate Andrew’s return on assets?

A. \( \frac{720,000}{480,000} \times \frac{720,000}{120,000} \)  
B. \( \frac{480,000}{720,000} \times \frac{720,000}{120,000} \)  
C. \( \frac{720,000}{480,000} \times \frac{120,000}{720,000} \)  
D. \( \frac{480,000}{720,000} \times \frac{120,000}{720,000} \)

- Answer (A) is incorrect because the DuPont model depicts return on assets as total asset turnover (sales divided by average total assets) times the profit margin (net income divided by sales).
- Answer (B) is incorrect for the same reason.
- Answer (C) is correct. The DuPont model depicts return on assets as total asset turnover (sales divided by average total assets) times the profit margin (net income divided by sales). Therefore, Andrew’s ROA calculation uses the formula \[ \left( \frac{720,000}{480,000} \right) \times \left( \frac{120,000}{720,000} \right) \].
- Answer (D) is incorrect for the same reason.

The Intelinet Corporation and Comp, Inc., have assets of $100,000 each and a return on common equity of 17%. Intelinet has twice the debt of Comp while Comp has half the sales of Intelinet. If Intelinet has net income of $10,000 and a total assets turnover ratio of 3.5, what is Comp Inc.’s profit margin?

A. 3.31%  
B. 7.71%  
C. 10.00%  
D. 13.50%

- Answer (A) is incorrect because this percentage is based on the wrong income.

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Answer (B) is correct. Since Intelinet’s ROCE, net income, assets, and debt (in terms of Comp’s debt) are known, they can be plugged into the formula for return on common equity to determine Comp’s debt level:

\[
\text{ROCE} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common equity}}
\]

\[
.17 = \frac{($10,000 - $0)}{($100,000 - 2D)}
\]

\[
.17 \times ($100,000 - 2D) = $10,000
\]

\[
$17,000 \times .34D = $10,000
\]

\[
.34D = $7,000
\]

\[
D = $20,588
\]

Now that Comp’s debt is known, it can be substituted in the ROCE formula to find net income:

\[
\text{ROCE} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common equity}}
\]

\[
.17 = \frac{(NI - $0)}{($100,000 - $20,588)}
\]

\[
NI = $13,500
\]

Since Comp’s sales are one-half those of Intelinet, they amount to $175,000 ($350,000 ÷ 2). Therefore, Comp’s profit margin percentage is $13,500 ÷ $175,000, or 7.71%.

Answer (C) is incorrect because this percentage is the return on assets for Intelinet Corp.

Answer (D) is incorrect because this percentage is the return on assets for Comp.
## Statement of Financial Position as of May 31 (in thousands)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$45</td>
<td>$38</td>
</tr>
<tr>
<td>Trading securities</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>68</td>
<td>48</td>
</tr>
<tr>
<td>Inventory</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td>22</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>$255</td>
<td>$216</td>
</tr>
<tr>
<td>Investments, at equity</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>Property, plant, and equipment (net)</td>
<td>375</td>
<td>400</td>
</tr>
<tr>
<td>Intangible assets (net)</td>
<td>80</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$748</td>
<td>$691</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Notes payable</td>
<td>$35</td>
<td>$18</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>70</td>
<td>42</td>
</tr>
<tr>
<td>Accrued expenses</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Income taxes payable</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td>$125</td>
<td>$80</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Deferred taxes</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>$163</td>
<td>$117</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Equity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred stock, 6%, $100 par value, cumulative</td>
<td>$150</td>
<td>$150</td>
</tr>
<tr>
<td>Common stock, $10 par value</td>
<td>225</td>
<td>195</td>
</tr>
<tr>
<td>Additional paid-in capital -- common stock</td>
<td>114</td>
<td>100</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>96</td>
<td>129</td>
</tr>
<tr>
<td><strong>Total equity</strong></td>
<td>$585</td>
<td>$574</td>
</tr>
<tr>
<td><strong>Total liabilities and equity</strong></td>
<td>$748</td>
<td>$691</td>
</tr>
</tbody>
</table>

## Income Statement for the year ended May 31 (in thousands)

<table>
<thead>
<tr>
<th></th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Net sales</strong></td>
<td>$480</td>
<td>$460</td>
</tr>
<tr>
<td>Costs and expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs of goods sold</td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td>Selling, general, and administrative expenses</td>
<td>52</td>
<td>51</td>
</tr>
<tr>
<td>Interest expense</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td><strong>Income before taxes</strong></td>
<td>$90</td>
<td>$85</td>
</tr>
<tr>
<td>Income taxes</td>
<td>36</td>
<td>34</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>$54</td>
<td>$51</td>
</tr>
</tbody>
</table>

[268] (Refers to Fact Pattern #48)

Assuming there are no preferred stock dividends in arrears, Devlin Company’s return on common equity for the year ended May 31, Year 2, was

A. 6.3%
B. 7.5%
C. 7.8%
D. 10.5%

- Answer (A) is incorrect because Average total assets are based on 6.3%.
• Answer (B) is incorrect because Net income divided by average total assets equals 7.5%.
• Answer (C) is incorrect because Net income divided by beginning total assets equals 7.8%.
• Answer (D) is correct. Return on common equity (ROCE) equals income available to common shareholders divided by average common equity. Devlin’s income available to common shareholders is $45 [($54 net income – ($150 par value of preferred stock × 6%)] and its average common equity is $429.5 ([($574 beginning total equity – $150 beginning preferred stock) + ($585 ending total equity – $150 ending preferred stock)] ÷ 2). Thus, the return is 10.5% ($45 ÷ $429.5).

If Company A has a higher rate of return on assets than Company B, the reason may be that Company A has a <List A> profit margin on sales, a <List B> asset turnover ratio, or both.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Higher</td>
</tr>
<tr>
<td>B.</td>
<td>Higher</td>
</tr>
<tr>
<td>C.</td>
<td>Lower</td>
</tr>
<tr>
<td>D.</td>
<td>Lower</td>
</tr>
</tbody>
</table>

• Answer (A) is correct. The DuPont model treats the return on assets as the product of the profit margin and the asset turnover:

\[
\text{Return on assets} = \text{Profit margin} \times \text{Asset turnover}
\]

\[
\frac{\text{Net income}}{\text{Assets}} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Assets}}
\]

If one company has a higher return on assets than another, it may have a higher profit margin, a higher asset turnover, or both.

• Answer (B) is incorrect because a higher profit margin on sales or a higher asset-turnover ratio may explain a higher return on assets.

• Answer (C) is incorrect because a higher profit margin on sales or a higher asset-turnover ratio may explain a higher return on assets.

• Answer (D) is incorrect because a higher profit margin on sales or a higher asset-turnover ratio may explain a higher return on assets.
[Fact Pattern #49]
The Statement of Financial Position for King Products Corporation for the fiscal years ended June 30, Year 2, and June 30, Year 1, is presented below. Net sales and cost of goods sold for the year ended June 30, Year 2, were $600,000 and $440,000, respectively.

King Products Corporation
Statement of Financial Position
(in thousands)

<table>
<thead>
<tr>
<th></th>
<th>June 30</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 2</td>
<td>Year 1</td>
</tr>
<tr>
<td>Cash</td>
<td>$ 60</td>
<td>$ 50</td>
</tr>
<tr>
<td>Marketable securities (at market)</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>90</td>
<td>60</td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>120</td>
<td>100</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$340</td>
<td>$280</td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>$200</td>
<td>$190</td>
</tr>
<tr>
<td>Building (net)</td>
<td>160</td>
<td>180</td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>190</td>
<td>200</td>
</tr>
<tr>
<td>Patents (net)</td>
<td>70</td>
<td>34</td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>40</td>
<td>26</td>
</tr>
<tr>
<td>Total long-term assets</td>
<td>$660</td>
<td>$630</td>
</tr>
<tr>
<td>Total assets</td>
<td>$1,000</td>
<td>$910</td>
</tr>
<tr>
<td>Notes payable</td>
<td>$ 46</td>
<td>$ 24</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>94</td>
<td>56</td>
</tr>
<tr>
<td>Accrued interest</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$170</td>
<td>$110</td>
</tr>
<tr>
<td>Notes payable, 10% due 12/31/Year 7</td>
<td>$ 20</td>
<td>$ 20</td>
</tr>
<tr>
<td>Bonds payable, 12% due 6/30/Year 10</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total long-term debt</td>
<td>$ 50</td>
<td>$ 50</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>$ 220</td>
<td>$160</td>
</tr>
<tr>
<td>Preferred stock -- 5% cumulative, $100 par, nonparticipating, authorized, issued and outstanding, 2,000 shares</td>
<td>$200</td>
<td>$200</td>
</tr>
<tr>
<td>Common stock -- $10 par, 40,000 shares authorized, 30,000 shares issued and outstanding</td>
<td>$ 300</td>
<td>$ 300</td>
</tr>
<tr>
<td>Additional paid-in capital -- common</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td>Total equity</td>
<td>$ 780</td>
<td>$750</td>
</tr>
<tr>
<td>Total liabilities &amp; equity</td>
<td>$1,000</td>
<td>$910</td>
</tr>
</tbody>
</table>

[270] (Refers to Fact Pattern #49)
Assuming that King Products Corporation’s net income for the year ended June 30, Year 2, was $70,000 and there are no preferred stock dividends in arrears, King Products Corporation’s return on common equity was

- A. 7.8%
- B. 10.6%
- C. 10.9%
- D. 12.4%

● Answer (A) is incorrect because The percentage 7.8% includes preferred equity in the denominator.
Answer (B) is correct. Return on common equity (ROCE) equals income available to common shareholders divided by the average common equity. King’s preferred stock dividend requirement is $10,000 ($200,000 par value × 5%), so the income available to common shareholders is $60,000 ($70,000 net income – $10,000). Given that preferred equity was $200,000 at all relevant times, beginning and ending common equity was $550,000 ($750,000 total – $200,000) and $580,000 ($780,000 total – $200,000), an average of $565,000 [($580,000 + $550,000) ÷ 2]. The return on common equity was therefore 10.6% ($60,000 ÷ $565,000).

Answer (C) is incorrect because Using beginning-of-the-year equity results in 10.9%.
Answer (D) is incorrect because Not subtracting the preferred dividend requirement from net income results in 12.4%.
Lisa, Inc.  
Statement of Financial Position  
December 31, Year 2  
(000s)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current assets:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$30</td>
<td>$25</td>
</tr>
<tr>
<td>Trading securities</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td>170</td>
<td>140</td>
</tr>
<tr>
<td><strong>Long-term investments:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Securities (at cost)</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td><strong>Property, plant, &amp; equipment:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Building (net)</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td><strong>Intangible assets</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patents (net)</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total long-term assets</strong></td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>$500</td>
<td>$455</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities &amp; Shareholders’ Equity</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current liabilities:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$23</td>
<td>$12</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>47</td>
<td>28</td>
</tr>
<tr>
<td>Accrued interest</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td>85</td>
<td>55</td>
</tr>
<tr>
<td><strong>Long-term debt:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes payable 10% due 12/31/Year 9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Bonds payable 12% due 12/31/Year 8</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total long-term debt</strong></td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td>$110</td>
<td>$80</td>
</tr>
</tbody>
</table>

| Shareholders’ equity:            |         |         |
| Preferred -- 5% cumulative, $100 par, non-participating, 1,000 shares authorized, issued and outstanding | 100 | 100 |
| Common -- $10 par 20,000 shares authorized, 15,000 issued and outstanding shares | 150 | 150 |
| Additional paid-in capital -- common | 75 | 75 |
| Retained earnings                | 65      | 50      |
| **Total shareholders’ equity**   | $390    | $375    |
| **Total liabilities & equity**   | $500    | $455    |
Assuming that Lisa, Inc.’s net income for Year 2 was $35,000, and there were no preferred stock dividends in arrears, Lisa’s return on common equity for Year 2 was

A. 7.8%
B. 10.6%
C. 10.9%
D. 12.4%

- Answer (A) is incorrect because including the $100,000 of preferred stock in the denominator results in 7.8%.
- Answer (B) is correct. Return on common equity (ROCE) equals income available to common shareholders divided by average common equity. Lisa’s preferred stock dividend requirement is 5%, or $5,000 ($100,000 \times 5\%). Subtracting the $5,000 of preferred dividends from the $35,000 of net income leaves $30,000 for the common shareholders. The firm began the year with common equity of $275,000 and ended with $290,000. Thus, the average common equity during the year was $282,500, and the return on common equity was 10.6% ($30,000 \div 282,500).
- Answer (C) is incorrect because the beginning shareholders’ equity of $275,000 is based on 10.9%.
- Answer (D) is incorrect because total net income of $35,000 is based on 12.4%.

<table>
<thead>
<tr>
<th>Account</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>$200,000</td>
</tr>
<tr>
<td>Cash</td>
<td>50,000</td>
</tr>
<tr>
<td>Net sales</td>
<td>600,000</td>
</tr>
<tr>
<td>Fixed assets (net)</td>
<td>320,000</td>
</tr>
<tr>
<td>Tax expense</td>
<td>67,500</td>
</tr>
<tr>
<td>Inventory</td>
<td>25,000</td>
</tr>
<tr>
<td>Common stock</td>
<td>100,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>20,000</td>
</tr>
<tr>
<td>Administrative expense</td>
<td>35,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>150,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>65,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>120,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>400,000</td>
</tr>
<tr>
<td>Depreciation expense</td>
<td>10,000</td>
</tr>
</tbody>
</table>

Additional Information:
- The opening balance of common stock was $100,000.
- The opening balance of retained earnings was $82,500.
- The company had 10,000 common shares outstanding all year.
- No dividends were paid during the year.
For the year just ended, the company had a rate of return on common equity, rounded to two decimals, of

A. 31.21%
B. 58.06%
C. 67.50%
D. 71.68%

- Answer (A) is correct. Return on common equity (ROCE) equals income available to common shareholders divided by average common equity. Since the company has no preferred stock, income available to common shareholders is the same as net income ($600,000 sales – $400,000 cost of goods sold – $35,000 administrative expenses – $10,000 depreciation – $20,000 interest expense – $67,500 taxes = $67,500). The opening balance of common equity was $182,500 ($100,000 common stock + $82,500 retained earnings) and the closing balance was $250,000 ($182,500 opening balance + $67,500 net income). Average common equity for the year was thus $216,250 [(182,500 + 250,000) ÷ 2]. Return on common equity was 31.21% ($67,500 ÷ 216,250).
- Answer (B) is incorrect because This percentage excludes common stock from the denominator.
- Answer (C) is incorrect because This percentage excludes retained earnings from the denominator.
- Answer (D) is incorrect because This percentage excludes interest expense and tax expense from the numerator.

Interstate Motors has decided to make an additional investment in its operating assets that are financed by debt. Assuming all other factors remain constant, this increase in investment will have which one of the following effects?

<table>
<thead>
<tr>
<th>Operating Income Margin</th>
<th>Operating Asset Turnover</th>
<th>Return on Operating Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Increase</td>
<td>No change</td>
<td>Increase</td>
</tr>
<tr>
<td>B. No change</td>
<td>Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>C. No change</td>
<td>Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. Decrease</td>
<td>Decrease</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Asset turnover will decrease.
- Answer (B) is correct. If all else remains constant, an additional investment in operating assets will not change income but will affect the balance sheet. Asset turnover will decrease because an unchanged numerator (sales) will be divided by an increased amount of fixed assets. Return on operating assets will decline because an unchanged numerator (income) will be divided by greater assets.
- Answer (C) is incorrect because Asset turnover will decrease.
- Answer (D) is incorrect because Operating income will not change.

If a company is profitable and is effectively using leverage, which one of the following ratios is likely to be the largest?

A. Return on total assets.
B. Return on operating assets.
C. Return on common equity.
D. Return on total equity.

- Answer (A) is incorrect because Return on total assets will be lower than the return on common equity if the firm is profitable and using leverage effectively.
Answer (B) is incorrect because Return on operating assets will be lower than the return on common equity if the firm is profitable and using leverage effectively.

Answer (C) is correct. The purpose of leverage is to use creditor capital to earn income for shareholders. If the return on the resources provided by creditors or preferred shareholders exceeds the cost (interest or fixed dividends), leverage is used effectively, and the return to common equity will be higher than the other measures. The reason is that common equity provides a smaller proportion of the investment than in an unleveraged company.

Answer (D) is incorrect because Return on total equity will be lower than the return on common equity if the firm is profitable and using leverage effectively.

[275] Of the following items, the one item that would not be considered in evaluating the adequacy of the budgeted annual operating income for a company is

A. Earnings per share.
B. Industry average for earnings on sales.
C. Internal rate of return.
D. Price-earnings ratio.

- Answer (A) is incorrect because EPS is a measure of financial performance.
- Answer (B) is incorrect because The industry average for earnings on sales is a measure of financial performance.
- Answer (C) is correct. When a company prepares the first draft of its pro forma income statement, management must evaluate whether earnings meet company objectives. This evaluation is based on such factors as desired earnings per share, average earnings for other firms in the industry, a desired price-earnings ratio, and needed return on investment. The internal rate of return is used to evaluate long-term investments, not budgets. It is the discount rate at which a project’s net present value is zero.
- Answer (D) is incorrect because The P/E ratio is a measure of financial performance.

[276] Transnational Motors has decided to make an additional investment in its operating assets, which are financed by debt. Assuming all other factors remain constant, this increase in investment will have which of the following effects?

<table>
<thead>
<tr>
<th>Operating Profit Margin</th>
<th>Total Asset Turnover</th>
<th>Return on Assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Increase</td>
<td>No Change</td>
<td>Increase</td>
</tr>
<tr>
<td>B. No Change</td>
<td>Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>C. No Change</td>
<td>Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. Decrease</td>
<td>Decrease</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Operating profit margin will not be affected by the purchase of assets because this transaction will have no effect on the income statement. However, the total asset turnover and the return on assets will both decrease, not remain constant and increase.
- Answer (B) is correct. An additional investment in operating assets that are financed by debt will cause assets and liabilities to increase proportionally. This transaction would have no effect on income statement balances. Therefore, there will be no change in operating profit margin (operating income ÷ sales). Both the total asset turnover (net sales ÷ average total assets) and the return on assets (net income ÷ average total assets) will decrease as the denominator for both of these ratios will increase, but the numerator remains constant.
- Answer (C) is incorrect because The total asset turnover will decrease, not increase. The denominator in this ratio is increasing while the numerator is staying constant, causing a decrease in the total ratio.
Answer (D) is incorrect because Operating profit margin will not be affected as the purchase of assets financed by debt will not affect any income statement amounts.

Zoron Corporation experienced the following year-over-year changes.

<table>
<thead>
<tr>
<th></th>
<th>Increased</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net profit margin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total asset turnover</td>
<td></td>
<td>40%</td>
</tr>
<tr>
<td>Total assets</td>
<td>Decreased</td>
<td>10%</td>
</tr>
<tr>
<td>Total equity</td>
<td>Increased</td>
<td>40%</td>
</tr>
</tbody>
</table>

Using DuPont analysis, what is the year-over-year change in Zoron’s return on equity (ROE)?

A. Increased 95.0%.
B. Increased 63.0%.
C. Increased 12.5%.
D. Increased 10.0%.

Answer (A) is incorrect because The DuPont Model for ROE is as follows: Net profit margin × Total asset turnover × Equity multiplier (Total assets ÷ Total equity). The year-over-year change is not calculated by simply adding and subtracting the increases and decreases from last year to this year. The incorrect amount of 95% results from adding and subtracting the year-over-year changes (25% + 40% – 10% + 40%).

Answer (B) is incorrect because The year-over-year change is not calculated by simply dividing the increase in the net profit margin by the increase in the total asset turnover.

Answer (C) is correct. The ROE using the DuPont analysis is calculated as follows:

Net profit margin × Total asset turnover × Equity multiplier (Total assets ÷ Total equity)

The best way to solve this problem is to use actual numbers for the return on equity comparison of this year to last year. Assuming that last year Zoron had a net profit margin of .025, total asset turnover of 1.05, total assets of $500,000, and total equity of $200,000, last year’s ROE is equal to 6.56% [.025 × 1.05 × ($500,000 ÷ $200,000)].

By using the information given in the problem, Zoron’s current-year amounts can be calculated, resulting in a net profit margin of .03125 (increased by 25%), total asset turnover of 1.47 (increased by 40%), total assets of $450,000 (decreased by 10%), and total equity of $280,000 (increased by 40%). Therefore, this year’s ROE is equal to 7.38% [.01325 × 1.47 × (450,000 ÷ 280,000)].

The increase in ROE from last year to this year can now be calculated as 12.5% [(7.38 – 6.56) ÷ 6.56].

Answer (D) is incorrect because This answer choice incorrectly multiplies the year-over-year change for the net profit margin by the year-over-year change for the total asset turnover to get an increase in ROE of 10.0%.

The issuance of new shares in a five-for-one split of common stock

A. Decreases the book value per share of common stock.
B. Increases the book value per share of common stock.
C. Increases total shareholders’ equity.
D. Decreases total shareholders’ equity.

Answer (A) is correct. Given that five times as many shares of stock are outstanding, the book value per share of common stock is one-fifth of the former value after the split.

Answer (B) is incorrect because The book value per share is decreased.
Answer (C) is incorrect because the stock split does not change the amount of shareholders’ equity.
Answer (D) is incorrect because the stock split does not change the amount of shareholders’ equity.

[279] Book value per common share represents the amount of equity assigned to each outstanding share of common stock.
Which one of the following statements about book value per common share is true?

A. Market price per common share usually approximates book value per common share.
B. Book value per common share can be misleading because it is based on historical cost.
C. A market price per common share that is greater than book value per common share is an indication of an overvalued stock.
D. Book value per common share is the amount that would be paid to shareholders if the company were sold to another company.

Answer (A) is incorrect because market price may be more or less than book value.
Answer (B) is incorrect. Book value is based on the financial statements, which are stated in terms of historical cost and nominal dollars. The figure can be misleading because fair values may differ substantially from book figures.
Answer (C) is incorrect because fair value may be more accurate than the carrying values if the historical cost figures are out of date.
Answer (D) is incorrect because the amount another company would pay would be based on fair values, not book values.

[280] The book value per share calculation of a corporation is usually significantly different from the market value of the stock’s selling price due to the

A. Use of accrual accounting in preparing financial statements.
B. Omission of the number of preferred shares outstanding at year-end in the calculation.
C. Use of historical costs in preparing financial statements.
D. Omission of total assets from the numerator in the calculation.

Answer (A) is incorrect because stock market investors base their decisions on fair values, and accrual accounting contributes to the determination of fair values. Thus, both book value and market value rely on accrual accounting.
Answer (B) is incorrect because preferred shares are not omitted when book value per share of preferred stock is calculated.
Answer (C) is correct. A stock’s book value is the amount of net assets available to the holders of a given type of stock, divided by the number of those shares outstanding. The market price is the amount that a stock market investor is willing to pay for the stock. The two values are normally different because the book value is based primarily on historical cost expressed in nominal dollars. Accordingly, the book value may be misleading because book values of assets may differ materially from the fair values of those same assets.
Answer (D) is incorrect because net, not total, assets are available to shareholders. Hence, the numerator in the book value calculation is based on net assets.
The Statement of Financial Position for King Products Corporation for the fiscal years ended June 30, Year 2, and June 30, Year 1, is presented below. Net sales and cost of goods sold for the year ended June 30, Year 2, were $600,000 and $440,000, respectively.

### King Products Corporation
### Statement of Financial Position

<table>
<thead>
<tr>
<th></th>
<th>June 30 Year 2</th>
<th>June 30 Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$ 60</td>
<td>$ 50</td>
</tr>
<tr>
<td>Marketable securities (at market)</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>90</td>
<td>60</td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>120</td>
<td>100</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$ 340</strong></td>
<td><strong>$280</strong></td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>$ 200</td>
<td>$190</td>
</tr>
<tr>
<td>Building (net)</td>
<td>160</td>
<td>180</td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>190</td>
<td>200</td>
</tr>
<tr>
<td>Patents (net)</td>
<td>70</td>
<td>34</td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>40</td>
<td>26</td>
</tr>
<tr>
<td><strong>Total long-term assets</strong></td>
<td><strong>$ 660</strong></td>
<td><strong>$630</strong></td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>$1,000</strong></td>
<td><strong>$910</strong></td>
</tr>
<tr>
<td>Notes payable</td>
<td>$ 46</td>
<td>$ 24</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>94</td>
<td>56</td>
</tr>
<tr>
<td>Accrued interest</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$ 170</strong></td>
<td><strong>$110</strong></td>
</tr>
<tr>
<td>Notes payable, 10% due 12/31/Year 7</td>
<td>$ 20</td>
<td>$ 20</td>
</tr>
<tr>
<td>Bonds payable, 12% due 6/30/Year 10</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total long-term debt</strong></td>
<td><strong>$ 50</strong></td>
<td><strong>$ 50</strong></td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td><strong>$ 220</strong></td>
<td><strong>$160</strong></td>
</tr>
<tr>
<td>Preferred stock -- 5% cumulative, $100 par, nonparticipating, authorized, issued and outstanding, 2,000 shares</td>
<td>$ 200</td>
<td>$200</td>
</tr>
<tr>
<td>Common stock -- $10 par, 40,000 shares authorized, 30,000 shares issued and outstanding</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Additional paid-in capital -- common</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>130</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total equity</strong></td>
<td><strong>$ 780</strong></td>
<td><strong>$750</strong></td>
</tr>
<tr>
<td><strong>Total liabilities &amp; equity</strong></td>
<td><strong>$1,000</strong></td>
<td><strong>$910</strong></td>
</tr>
</tbody>
</table>

[281] (Refers to Fact Pattern #52)
Assuming that there are no preferred stock dividends in arrears, King Products Corporation’s book value per share of common stock at June 30, Year 2, was

A. $10.00  
B. $14.50  
C. $18.33  
D. $19.33
Answer (A) is incorrect because The par value per share of the common stock is $10; book value includes additional paid-in capital and retained earnings.
Answer (B) is incorrect because The amount of $14.50 is based on 40,000 authorized shares.
Answer (C) is incorrect because The book value at the end of Year 1 was $18.33.
Answer (D) is correct. Book value equals equity attributable to a class of stock divided by the number of shares outstanding. At year-end, 30,000 shares of common stock are outstanding. Equity attributable to the common shareholders includes all equity except preferred stock. Thus, the book value of a share of common stock is $19.33 [($780,000 total equity – $200,000 preferred stock) ÷ 30,000 shares of common stock].

The equity section of Jones Corporation’s statement of financial position is presented below:

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred stock, 6%, $100 par</td>
<td>$40,000,000</td>
</tr>
<tr>
<td>Common stock, $4 par</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Additional paid-in capital</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>10,000,000</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td><strong>$80,000,000</strong></td>
</tr>
</tbody>
</table>

The preferred stock is cumulative and nonparticipating. All preferred dividends have been paid, and liquidation value is $110 per preferred share. What is the book value per share of Jones Corporation’s common stock?

A. $100
B. $16
C. $14.40
D. $4

Answer (A) is incorrect because The par value of a preferred share is $100.
Answer (B) is incorrect because The amount of $16 fails to consider the liquidation value of the preferred stock in excess of its par value.
Answer (C) is correct. The liquidation value of the preferred stock is $44,000,000 ($40,000,000 × 1.1). The book value per common share equals the net assets (equity) attributable to common shareholders divided by the common shares outstanding, or $14.40 [($80,000,000 total equity – 44,000,000 preferred equity) ÷ ($10,000,000 common stock ÷ $4 par) common shares].
Answer (D) is incorrect because The par value of a common share is $4.
Lisa, Inc.
Statement of Financial Position
December 31, Year 2
(000s)

<table>
<thead>
<tr>
<th>Assets</th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>$30</td>
<td>$25</td>
</tr>
<tr>
<td>Trading securities</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Inventories (at lower of cost or market)</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Prepaid items</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Total current assets</td>
<td>170</td>
<td>140</td>
</tr>
<tr>
<td>Long-term investments:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Securities (at cost)</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>Property, plant, &amp; equipment:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land (at cost)</td>
<td>75</td>
<td>75</td>
</tr>
<tr>
<td>Building (net)</td>
<td>80</td>
<td>90</td>
</tr>
<tr>
<td>Equipment (net)</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>Intangible assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patents (net)</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>Goodwill (net)</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>Total long-term assets</td>
<td>330</td>
<td>315</td>
</tr>
<tr>
<td>Total assets</td>
<td>$500</td>
<td>$455</td>
</tr>
</tbody>
</table>

Liabilities & Shareholders’ Equity

| Current liabilities:        |        |        |
| Notes payable               | $23    | $12    |
| Accounts payable            | 47     | 28     |
| Accrued interest            | 15     | 15     |
| Total current liabilities   | 85     | 55     |
| Long-term debt:             |        |        |
| Notes payable 10% due 12/31/Year 9 | 10 | 10 |
| Bonds payable 12% due 12/31/Year 8 | 15 | 15 |
| Total long-term debt        | 25     | 25     |
| Total liabilities           | $110   | $80    |
| Shareholders’ equity:       |        |        |
| Preferred -- 5% cumulative, $100 par, non-participating, 1,000 shares authorized, issued and outstanding | $100 | $100 |
| Common -- $10 par 20,000 shares authorized, 15,000 issued and outstanding shares | 150 | 150 |
| Additional paid-in capital -- common | 75 | 75 |
| Retained earnings           | 65     | 50     |
| Total shareholders’ equity  | $390   | $375   |
| Total liabilities & equity  | $500   | $455   |
Assuming that there are no preferred stock dividends in arrears, Lisa, Inc.’s book value per share of common stock at December 31, Year 2, was

A. $10.00  
B. $11.25  
C. $14.50  
D. $19.33

- Answer (A) is incorrect because the par value per share is $10, which is not the same as book value.
- Answer (B) is incorrect because the sum of common stock and additional paid-in capital divided by the common shares authorized equals $11.25.
- Answer (C) is incorrect because the amount of $14.50 is based on the number of shares authorized (20,000).
- Answer (D) is correct. The book value of common stock is computed by dividing the total equity attributable to common stock by the number of common shares outstanding. Lisa has 15,000 common shares outstanding. All of the shareholders’ equity is attributable to common stock except for that attributable to preferred stock. Thus, $290,000 ($390,000 total – $100,000 preferred stock) is attributable to the common stock. Dividing $290,000 of equity by 15,000 shares results in a book value of $19.33 per share.
[Fact Pattern #54]
The data presented below show actual figures for selected accounts of McKeon Company for the fiscal year ended May 31, Year 1, and selected budget figures for the Year 2 fiscal year. McKeon’s controller is in the process of reviewing the Year 2 budget and calculating some key ratios based on the budget. McKeon Company monitors yield or return ratios using the average financial position of the company. (Round all calculations to three decimal places if necessary.)

<table>
<thead>
<tr>
<th>Account</th>
<th>5/31/Year 2</th>
<th>5/31/Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$210,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Noncurrent assets</td>
<td>275,000</td>
<td>255,000</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>78,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>75,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Common stock ($30 par value)</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>32,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

Year 2 Operations

- Sales* $350,000
- Cost of goods sold 160,000
- Interest expense 3,000
- Income taxes (40% rate) 48,000
- Dividends declared and paid in Year 2 60,000
- Administrative expense 67,000

*All sales are credit sales.

The per share book value of McKeon Company’s common stock for Year 2 is

- A. $33.20
- B. $32.00
- C. $30.00
- D. $32.60

Answer (A) is correct. When no preferred stock is outstanding, the book value per share equals total shareholders’ equity divided by the number of shares outstanding at the balance sheet date. Thus, dividing $332,000 ($300,000 common stock + $32,000 retained earnings) by 10,000 shares results in a book value of $33.20 per share.

Answer (B) is incorrect because Book value per common share is the sum of equity attributable to common stock and retained earnings divided by the number of common shares outstanding.

Answer (C) is incorrect because Book value per common share is the sum of equity attributable to common stock and retained earnings divided by the number of common shares outstanding.

Answer (D) is incorrect because Book value per common share is the sum of equity attributable to common stock and retained earnings divided by the number of common shares outstanding.
Consider the following financial statement:

<table>
<thead>
<tr>
<th></th>
<th>Larsen Manufacturing, Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statement of Financial Position</td>
</tr>
<tr>
<td></td>
<td>December 31 (in thousands)</td>
</tr>
</tbody>
</table>

| Assets       |              |  |
|--------------|--------------|
| Current assets | $  8,018    |  |
| Long-term assets | 10,308      |  |
| **Total assets** | **$18,326** |  |

| Liabilities   |              |  |
|---------------|--------------|
| Current liabilities | $     998   |  |
| Long-term debt | 3,394       |  |
| **Total liabilities** | **$  4,392** |  |

| Shareholders’ equity |              |  |
|----------------------|--------------|
| Preferred – 6% cumulative, $100 par, authorized, issued, and outstanding 35,000 shares | $  3,500 |
| Common – $5 par, 3,000,000 shares authorized, 1,050,000 shares issued and outstanding | 5,250 |
| Additional paid-in capital – common | 2,625 |
| Retained earnings | 2,559 |
| **Total shareholders’ equity** | **$13,934** |
| **Total liabilities and equity** | **$18,326** |

Based on the above financial data and assuming that Larsen had no preferred stock dividends in arrears, the company’s book value per share at December 31 of the current year is

A. $5.00  
B. $7.50  
C. $9.94  
D. $13.27

- Answer (A) is incorrect because Improperly counting only the value of common stock in the numerator results in $5.00.
- Answer (B) is incorrect because Improperly including only common stock and additional paid-in capital on common stock in the numerator results in $7.50.
- Answer (C) is correct. Book value per share is calculated with the following ratio:

$$
\text{Book value per share} = \frac{\text{Total equity} - \text{Liquidation value of preferred equity}}{\text{Common shares outstanding}}
$$

For Larsen, the calculation is as follows:

$$
\text{Book value per share} = \frac{($13,934,000 - $3,500,000)}{1,050,000} = \frac{10,434,000}{1,050,000} = 9.937
$$

- Answer (D) is incorrect because Failing to deduct the liquidation value of preferred stock from the numerator results in $13.27.
At the end of its fiscal year on December 31, Year 6, Merit Watches had total shareholders’ equity of $24,209,306. Of this total, $3,554,405 was preferred equity. During Fiscal Year 7, Merit’s net income after tax was $2,861,003. During Year 7, Merit paid preferred share dividends of $223,551 and common share dividends of $412,917. At December 31, Year 7, Merit had 12,195,799 common shares outstanding, and the company did not sell any common shares during the year. What was Merit Watches’ book value per share on December 31, Year 7?

A. $1.88  
B. $2.17  
C. $1.91  
D. $2.20

Answer (A) is correct. Book value per share is calculated with the following ratio:

\[
\text{Book value per share} = \frac{\text{Total equity} - \text{Preferred equity} - \text{Preferred dividends} - \text{Common dividends}}{\text{Common shares outstanding}}
\]

Merit's can be calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total shareholders' equity</td>
<td>$24,209,306</td>
</tr>
<tr>
<td>Add: net income</td>
<td>$2,861,003</td>
</tr>
<tr>
<td>Less: preferred stock</td>
<td>($3,554,405)</td>
</tr>
<tr>
<td>Less: preferred dividends</td>
<td>($223,551)</td>
</tr>
<tr>
<td>Less: common dividends</td>
<td>($412,917)</td>
</tr>
<tr>
<td>Total book value</td>
<td>$22,879,436</td>
</tr>
</tbody>
</table>

Book value per share = $22,879,436 ÷ 12,195,799  
= $1.876

Answer (B) is incorrect because the amount of $2.17 results from failing to deduct preferred stock from the numerator.  
Answer (C) is incorrect because the amount of $1.91 results from failing to deduct common stock dividends from the numerator.  
Answer (D) is incorrect because the amount of $2.20 results from failing to deduct preferred stock and common dividends from the numerator.

Which one of the following statements about the price-earnings (P/E) ratio is true?

A. A company with high growth opportunities ordinarily has a high P/E ratio.  
B. A P/E ratio has more meaning when a firm has losses than when it has profits.  
C. A P/E ratio has more meaning when a firm has abnormally low profits in relation to its asset base.  
D. A P/E ratio expresses the relationship between a firm’s market price and its net sales.

Answer (A) is correct. A company with high growth opportunities typically has a high P/E ratio because investors are willing to pay a price for the stock higher than that justified by current earnings. In effect, they are trading current earnings for potential future earnings.  
Answer (B) is incorrect because a P/E ratio cannot be computed when a firm has losses.  
Answer (C) is incorrect because a firm with abnormally low profits could have an extremely high, and thus meaningless, P/E ratio.  
Answer (D) is incorrect because the P/E ratio expresses the relationship between market price and a firm’s EPS.
Information concerning Hamilton’s common stock is presented below for the fiscal year ended May 31, Year 2.

<table>
<thead>
<tr>
<th>Common stock outstanding</th>
<th>750,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stated value per share</td>
<td>$15.00</td>
</tr>
<tr>
<td>Market price per share</td>
<td>45.00</td>
</tr>
<tr>
<td>Year 1 dividends paid per share</td>
<td>4.50</td>
</tr>
<tr>
<td>Year 2 dividends paid per share</td>
<td>7.50</td>
</tr>
<tr>
<td>Basic earnings per share</td>
<td>11.25</td>
</tr>
<tr>
<td>Diluted earnings per share</td>
<td>9.00</td>
</tr>
</tbody>
</table>

The price-earnings ratio for Hamilton’s common stock is

A. 3.0 times.
B. 4.0 times.
C. 5.0 times.
D. 6.0 times.

- Answer (A) is incorrect because the figure of 3.0 is based on use of the stated value per share as the denominator.
- Answer (B) is incorrect because the figure of 4.0 is based on erroneously using the basic earnings per share as the denominator.
- Answer (C) is correct. The price-earnings ratio is calculated by dividing the current market price of the stock by the earnings per share. Diluted earnings per share is used if disclosed. Thus, Hamilton’s price-earnings ratio is 5.0 ($45 market price ÷ $9 DEPS).
- Answer (D) is incorrect because the figure of 6.0 is derived by using Year 2 dividends per share as the denominator.

The following information is provided about the common stock of Evergreen, Inc., at the end of the fiscal year:

<table>
<thead>
<tr>
<th>Number of shares outstanding</th>
<th>1,800,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Par value per share</td>
<td>$ 10.00</td>
</tr>
<tr>
<td>Dividends paid per share (last 12 months)</td>
<td>12.00</td>
</tr>
<tr>
<td>Market price per share</td>
<td>108.00</td>
</tr>
<tr>
<td>Basic earnings per share</td>
<td>36.00</td>
</tr>
<tr>
<td>Diluted earnings per share</td>
<td>24.00</td>
</tr>
</tbody>
</table>

The price-earnings ratio for Evergreen’s common stock is

A. 3.0 times.
B. 4.5 times.
C. 9.0 times.
D. 10.8 times.

- Answer (A) is incorrect because the figure 3.0 is based on BEPS rather than DEPS in the denominator.
- Answer (B) is correct. The price-earnings ratio is

\[
\frac{\text{Market Price}}{\text{Diluted EPS}}
\]

For Evergreen, the calculation is $108 ÷ $24 = 4.5.
- Answer (C) is incorrect because the figure 9.0 is based on dividends rather than DEPS in the denominator.
- Answer (D) is incorrect because the figure 10.8 is based on par value rather than DEPS in the denominator.
Information concerning the common stock of Morris Company as of November 30, the end of the company’s current fiscal year, is presented below.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of shares outstanding</td>
<td>460,000</td>
</tr>
<tr>
<td>Par value per share</td>
<td>$ 5.00</td>
</tr>
<tr>
<td>Dividends paid per share in current year</td>
<td>6.00</td>
</tr>
<tr>
<td>Market price per share</td>
<td>54.00</td>
</tr>
<tr>
<td>Basic earnings per share</td>
<td>18.00</td>
</tr>
<tr>
<td>Diluted earnings per share</td>
<td>12.00</td>
</tr>
</tbody>
</table>

The price-earnings ratio for Morris Company’s common stock is

A. 10.8 times.  
B. 3.0 times.  
C. 9.0 times.  
D. 4.5 times.

- Answer (A) is incorrect because the figure of 10.8 times is calculated using the $5.00 par value instead of diluted earnings per share of $12.
- Answer (B) is incorrect because the figure of 3.0 times is calculated using the $18.00 basic earnings per share instead of diluted earnings per share.
- Answer (C) is incorrect because the figure of 9.0 times is calculated using the $6.00 of dividends instead of diluted earnings per share.
- Answer (D) is correct. Stock analysts usually determine the price-earnings ratio by dividing the current market price by diluted EPS, which may give a higher value than using basic EPS (DEPS is always equal to or less than BEPS). Thus, Morris’ price-earnings ratio is 4.5 times ($54 ÷ $12).

Kevlin, Inc., has 250,000 shares of $10 par value common stock outstanding. For the current year, Kevlin paid a cash dividend of $3.50 per share and had earnings per share of $4.80. The market price of Kevlin’s stock is $34 per share. Kevlin’s price-earnings ratio is

A. 2.08  
B. 2.86  
C. 7.08  
D. 9.71  

- Answer (A) is incorrect because the figure 2.08 results from using the par value, rather than the market price, in the numerator.
- Answer (B) is incorrect because the figure 2.86 results from improperly dividing the par value by the dividend per share.
- Answer (C) is correct. The price-earnings ratio is the market price of the common stock per share divided by diluted earnings per share. Kevlin’s is thus 7.08 ($34 ÷ $4.80).
- Answer (D) is incorrect because the figure 9.71 results from using dividend per share, rather than earnings per share, in the denominator.
A steady drop in a firm’s price-earnings ratio could indicate that

- Answer (A) is incorrect. Earnings per share is the denominator of the price-earnings ratio. An increase in the denominator while the numerator remains the same results in a fall in the overall ratio.
- Answer (B) is incorrect because a decrease in earnings per share would cause an increase in the price-earnings ratio.
- Answer (C) is incorrect because a rise in the market price would cause an increase in the price-earnings ratio.
- Answer (D) is incorrect because if both numerator and denominator are rising, the overall ratio will increase.

At year end, Appleseed Company reported net income of $588,000. The company has 10,000 shares of $100 par value, 6% preferred stock and 120,000 shares of $10 par value common stock outstanding and 5,000 shares of common stock in treasury. There are no dividend payments in arrears, and the market price per common share at the end of the year was $40. Appleseed’s price-earnings ratio is

- Answer (A) is incorrect because the figure 9.47 results from improperly including treasury stock in the computation of earnings per share.
- Answer (B) is correct. The price-earnings ratio is the market price of the common stock per share divided by diluted earnings per share. To arrive at income available to common shareholders, dividends on preferred stock must be subtracted from net income ($588,000 – (10,000 preferred shares x $100 par value x 6%) = $528,000), making the per-share amount $4.40 ($528,000 ÷ 120,000 common shares). Appleseed’s price-earnings ratio is thus 9.09 ($40 ÷ $4.40).
- Answer (C) is incorrect because the figure 8.50 is based on an erroneous calculation of preferred dividends.
- Answer (D) is incorrect because the figure 8.16 results from failing to deduct dividends on preferred stock from net income.

Archer, Inc., has 500,000 shares of $10 par value common stock outstanding. For the current year, Archer paid a cash dividend of $4.00 per share and had earnings per share of $3.20. The market price of Archer’s stock is $36 per share. The average price-earnings ratio for Archer’s industry is 14.00. When compared to the industry average, Archer’s stock appears to be

- Answer (A) is incorrect because Archer’s price-earnings ratio trails that of its industry, indicating undervaluation.
- Answer (B) is incorrect because Archer’s price-earnings ratio trails that of its industry, indicating undervaluation.
- Answer (C) is incorrect because the undervaluation is more than 10%.
Answer (D) is correct. The price-earnings ratio is the market price of the common stock per share divided by diluted earnings per share. Archer’s price-earnings ratio is thus 11.25 ($36 ÷ $3.20). The difference between this ratio and the industry average is 2.75, an undervaluation of 24.4% (2.75 ÷ 11.25).

When reviewing a credit application, the credit manager should be most concerned with the applicant’s

A. Profit margin and return on assets.
B. Price-earnings ratio and current ratio.
C. Working capital and return on equity.
D. Working capital and current ratio.

Answer (A) is incorrect because Profit margin and return on assets are not the best indicators of liquidity, which is the area of most concern when considering granting credit to a customer.
Answer (B) is incorrect because The price-earnings ratio is not the best indicator of liquidity, which is the area of most concern when considering granting credit to a customer.
Answer (C) is incorrect because Return on equity is not the best indicator of liquidity, which is the area of most concern when considering granting credit to a customer.
Answer (D) is correct. Liquidity is a firm’s ability to pay its current obligations as they come due and thus remain in business in the short run. This is the area of most concern when considering granting credit to a customer.

A company had 150,000 shares outstanding on January 1. On March 1, 75,000 additional shares were issued through a stock dividend. Then on November 1, the company issued 60,000 shares for cash. The number of shares to be used in the denominator of the EPS calculation for the year is

A. 222,500 shares.
B. 225,000 shares.
C. 235,000 shares.
D. 285,000 shares.

Answer (A) is incorrect because The weighted-average number of shares is 222,500 if the stock dividend is not treated as retroactive.
Answer (B) is incorrect because The 225,000 number of shares ignores the November 1 issuance.
Answer (C) is correct. The weighted average number of common shares outstanding during the year is the EPS denominator. Shares issued in a stock dividend are assumed to have been outstanding as of the beginning of the earliest accounting period presented. Thus, the 75,000 shares issued on March 1 are deemed to have been outstanding on January 1. The EPS denominator equals 235,000 shares \[[(150,000 \times (12 \text{ months} ÷ 12 \text{ months})] + [75,000 \times (12 \text{ months} ÷ 12 \text{ months})] + [60,000 \times (2 \text{ months} ÷ 12 \text{ months})]] \]
Answer (D) is incorrect because The year-end number of outstanding shares is 285,000.

What type of ratio is earnings per share?

A. Profitability ratio.
B. Activity ratio.
C. Liquidity ratio.
D. Leverage ratio.
Answer (A) is correct. Earnings per share is a profitability ratio. It measures the level of profitability of the firm on a per-share basis.

Answer (B) is incorrect because Activity ratios measure management’s efficiency in using specific resources.

Answer (C) is incorrect because Liquidity ratios indicate the ability of a company to meet short-term obligations.

Answer (D) is incorrect because Leverage or equity ratios concern the relationship of debt to equity and measure the impact of the debt on profitability and risk.

[298] Blackmer Company had 80,000 shares of common stock outstanding as of December 1, Year 1, the beginning of the company’s fiscal year. The company also had $200,000 of 8% convertible bonds outstanding that had been issued at $1,000 par. The bonds were convertible into 20,000 shares of common stock. The company’s tax rate is 34%. The company’s net income for the year was $107,000, and no bonds were converted during the year. The diluted earnings per share (rounded to the nearest cent) of Blackmer common stock for the fiscal year ended November 30, Year 2, was

A. $1.18 per share.
B. $1.07 per share.
C. $1.20 per share.
D. $1.23 per share.

Answer (A) is correct. DEPS is net income available to common shareholders plus amounts that would not have had to be paid if dilutive potential stock had been converted, divided by common shares outstanding plus the weighted-average number of additional shares of common stock that would have been outstanding if dilutive potential common stock had been converted. Thus, the denominator of the EPS calculation equals the 80,000 common shares on December 1, Year 1, plus the 20,000 shares that could be issued if the bonds were converted, for a total of 100,000 shares. The bonds are deemed converted at the beginning of the year. The numerator is the $107,000 of net income plus an adjustment for interest that would not have been paid if the bonds had been converted. The hypothetical interest saved is $16,000 ($200,000 of bonds × 8%). However, income would not be increased by $16,000 because the interest was tax deductible. Thus, the after-tax increase in net income would have been $10,560 ($16,000 × (1.0 – .34)). Adding the $10,560 to the reported income of $107,000 produces a numerator of $117,560. Dividing the $117,560 by the 100,000 shares presumed outstanding results in a DEPS of $1.18 per share.

Answer (B) is incorrect because This figure is calculated using net income of $107,000.

Answer (C) is incorrect because This figure is calculated using 10% as the bond interest rate instead of 8%.

Answer (D) is incorrect because This figure is calculated using $107,000 net income plus the unadjusted $16,000 interest that would have been paid if bonds had not been converted.

[299] The Dwyer Company balance sheet indicates that the company has $2,000,000 of 7.5% convertible bonds, $1,000,000 of 9% preferred stock, par value $100, and $1,000,000 common stock, par value $10. The company reported net income of $317,000. The bonds can be converted into 50,000 common shares. The income tax rate is 36%. Which one of the following would Dwyer report as diluted earnings per share?

A. $2.11
B. $2.15
C. $2.27
D. $2.51

Answer (A) is incorrect because Failing to adjust the numerator for the payment of preferred dividends and the after-tax savings on bond interest results in $2.11.
Answer (B) is correct. The diluted earnings per share numerator consists of income available to common shareholders, that is, net income adjusted for the effect of convertible securities. The preferred dividends ($1,000,000 × 9% = $90,000) must be paid in any case because the preferred stock is not convertible. The after-tax effect of the bond interest ($2,000,000 × 7.5% = $150,000) is added back because the bonds are convertible. The numerator is thus calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income</td>
<td>$317,000</td>
</tr>
<tr>
<td>Less: preferred dividends</td>
<td>(90,000)</td>
</tr>
<tr>
<td>Add: savings on bond interest</td>
<td>96,000</td>
</tr>
<tr>
<td>Income available to common shareholders</td>
<td>$323,000</td>
</tr>
</tbody>
</table>

The denominator consists of the number of common shares outstanding, taking into account the effects of all dilutive securities. There are 100,000 shares of common stock outstanding ($1,000,000 ÷ $10 par). Adding the 50,000 shares that would be issued if the bonds were converted gives a denominator of 150,000 shares. Dwyer’s diluted earnings per share is thus $2.1533 ($323,000 ÷ 150,000).

Answer (C) is incorrect because Failing to account for the conversion of the bonds in both the numerator and denominator results in $2.27.

Answer (D) is incorrect because Failing to add back the tax savings on bond interest to the numerator results in $2.51.

For the year ended May 31, Year 2, Cooper, Inc., had per-share earnings of $4.80. Cooper’s outstanding stock for the Year 1-Year 2 fiscal year consisted of $2,000,000 of 10% preferred with $100 par value and 1,000,000 shares of common. On June 1, Year 2, the common stock split 3 for 1, and the company redeemed one-half of the preferred stock at par value. Cooper’s net income for the year ended May 31, Year 3, was 10% higher than in Year 2. Earnings per share in Year 3 on Cooper’s common stock were

A. $1.76
B. $1.80
C. $5.28
D. $5.40

Answer (A) is incorrect because Using Year 2 net income available to common shareholders increased by 10% for Year 3 instead of net income available to common shareholders for Year 3 results in $1.76.

Answer (B) is correct. The EPS for Year 2 of $4.80 indicates a net income available to common shareholders of $4,800,000. Dividends on preferred stock would have been $200,000 ($2,000,000 × 10%). Thus, the net income must have been $5,000,000. A 10% increase for Year 3 would result in net income of $5,500,000. Only $100,000 ($1,000,000 × 10%) would be required for preferred dividends in Year 3, leaving $5,400,000 for common shareholders. After the 3-for-1 split, EPS would be $1.80 ($5,400,000 ÷ 3,000,000 shares).

Answer (C) is incorrect because Using Year 2 net income available to common shareholders increased by 10% for Year 3 instead of net income available to common shareholders for Year 3 results in $5.28. It also results from not increasing the number of common shares outstanding to allow for the stock split.

Answer (D) is incorrect because Not increasing the number of common shares outstanding to allow for the stock split results in $5.40.

If a stock currently sells for $40.00 and has annual earnings per share of $3.00, the P/E ratio is

A. 0.075
B. 43
C. 13.33
D. 120
Answer (A) is incorrect because the numerator and denominator are reversed.
Answer (B) is incorrect because the two amounts are not added.
Answer (C) is correct. The P/E ratio is computed by dividing the market price by EPS. Thus, $40 ÷ $3 = 13.33.
Answer (D) is incorrect because the two amounts are not multiplied.

Baylor Company paid out one-half of last year’s earnings in dividends. Baylor’s earnings increased by 20%, and the amount of its dividends increased by 15% in the current year. Baylor’s dividend payout ratio for the current year was

A. 50%
B. 57.5%
C. 47.9%
D. 78%

Answer (A) is incorrect because the prior-year payout ratio is 50%.
Answer (B) is incorrect because the figure of 57.5% is 115% of the prior-year payout ratio.
Answer (C) is correct. The prior-year dividend payout ratio was 50%. Hence, if prior-year net income was X, the total dividend payout would have been 50%X. If earnings increase by 20%, current-year income will be $120X. If dividends increase by 15%, the total dividends paid out will be 57.5%X (115% × 50%X), and the new dividend payout ratio will be 47.9% (57.5%X ÷ $120X).
Answer (D) is incorrect because the figure of 78% equals 65% of 120%.

[Fact Pattern #55]
The financial statements for Dividendosaurus, Inc., for the current year are as follows:

<table>
<thead>
<tr>
<th>Balance Sheet</th>
<th>Statement of Income and Retained Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$100 Sales</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>200 Cost of goods sold</td>
</tr>
<tr>
<td>Inventory</td>
<td>50 Gross profit</td>
</tr>
<tr>
<td>Net fixed assets</td>
<td>600 Operations expenses</td>
</tr>
<tr>
<td>Total</td>
<td>$950 Operating income</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$140 Interest expense</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>300 Income before tax</td>
</tr>
<tr>
<td>Capital stock</td>
<td>260 Income tax</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>250 Net income</td>
</tr>
<tr>
<td>Total</td>
<td>$950 Add: Jan. 1 retained earnings</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dividendosaurus has a dividend-payout ratio of

A. 19.6%
B. 28.6%
C. 40.0%
D. 50.0%

- Answer (A) is incorrect because the ratio of dividends paid to the December 31 book value of common equity is 19.6%.
- Answer (B) is incorrect because the ratio of dividends paid to the sum of beginning retained earnings and net income is 28.6%.
- Answer (C) is incorrect because the ratio of dividends paid to the December 31 retained earnings is 40.0%.
- Answer (D) is correct. The dividend payout ratio is the ratio of dividends paid to net income for the period. Hence, it equals 50.0% ($100 dividends ÷ $200 NI).

Residco, Inc., expects net income of $800,000 for the next fiscal year. Its targeted and current capital structure is 40% debt and 60% common equity. The director of capital budgeting has determined that the optimal capital spending for next year is $1.2 million. If Residco follows a strict residual dividend policy, what is the expected dividend-payout ratio for next year?

A. 90.0%
B. 66.7%
C. 40.0%
D. 10.0%

- Answer (A) is incorrect because this percentage is the reinvestment ratio.
- Answer (B) is incorrect because this percentage is the ratio between earnings and investment.
- Answer (C) is incorrect because the percentage is the ratio of debt in the ideal capital structure.
- Answer (D) is correct. Under the residual theory of dividends, the residual of earnings paid as dividends depends on the available investments and the debt-equity ratio at which cost of capital is minimized. The rational investor should prefer reinvestment of retained earnings when the return exceeds what the investor could earn on investments of equal risk. However, the firm may prefer to pay dividends when investment returns are poor and the internal equity financing would move the firm away from its ideal capital structure. If Residco wants to maintain its current structure, 60% of investments should be financed from equity. Hence, it needs $720,000 ($1,200,000 × 60%) of equity funds, leaving $80,000 of net income ($800,000 NI – $720,000) available for dividends. The dividend-payout ratio is therefore 10% ($80,000 ÷ $800,000 NI).

All else being equal, a company with a higher dividend-payout ratio will have a <List A> debt-to-assets ratio and a <List B> current ratio.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Higher</td>
</tr>
<tr>
<td>B.</td>
<td>Higher</td>
</tr>
<tr>
<td>C.</td>
<td>Lower</td>
</tr>
<tr>
<td>D.</td>
<td>Lower</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because the current ratio will be lower.
Answer (B) is correct. A company with a higher dividend payout ratio is distributing more of its earnings as dividends to common shareholders. It will have less cash and less total assets than a comparable firm with a lower payout ratio. The debt-to-assets ratio will be higher because total assets are lower, and the current ratio will be lower because cash is lower.

Answer (C) is incorrect because The debt-to-assets ratio will be higher and the current ratio will be lower.

Answer (D) is incorrect because The debt-to-assets ratio will be higher.

[306] Which of the following is correct for a firm with $100,000 in net earnings, 10,000 shares, and a 30% payout ratio?

A. Retained earnings will increase by $30,000.
B. Each share will receive a $0.30 dividend.
C. $30,000 will be spent on new investment.
D. The dividend per share will equal $3.00.

Answer (A) is incorrect because Retained earnings will increase by $70,000.

Answer (B) is incorrect because Each share will receive a $3 dividend.

Answer (C) is incorrect because The amount of $70,000 is being retained for new investment.

Answer (D) is correct. Earnings per share is $10 ($100,000 ÷ 10,000 shares). Of the $10, 30%, or $3, is paid out as a dividend.

[307] Appalachian Outfitters, Inc., a mail order supplier of camping gear, is putting together its current-year statement of cash flow. A comparison of the company’s year-end balance sheet with the prior year’s balance sheet shows the following changes from a year ago.

<table>
<thead>
<tr>
<th>Assets</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash &amp; marketable securities</td>
<td>$ (600)</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>200</td>
</tr>
<tr>
<td>Inventories</td>
<td>(100)</td>
</tr>
<tr>
<td>Gross fixed assets</td>
<td>4,600</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>(500)</td>
</tr>
<tr>
<td>Total</td>
<td>$3,600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities &amp; Net Worth</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$ 250</td>
</tr>
<tr>
<td>Accruals</td>
<td>50</td>
</tr>
<tr>
<td>Long-term note</td>
<td>(300)</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>1,400</td>
</tr>
<tr>
<td>Common stock</td>
<td>0</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>2,200</td>
</tr>
<tr>
<td>Total</td>
<td>$3,600</td>
</tr>
</tbody>
</table>

The firm’s payout ratio is 20%. During the current year, net cash provided by operations amounted to

A. $2,900
B. $3,050
C. $3,450
D. $4,050
Answer (A) is incorrect because the amount of $2,900 excludes the adjustments for depreciation and accruals of liabilities other than accounts payable.

Answer (B) is incorrect because the amount of $3,050 excludes the adjustments for inventory, accounts payable, and accruals.

Answer (C) is correct. The net profit after taxes equals the change in retained earnings divided by 1 minus the dividend payout ratio, or $2,750 [$2,200 ÷ (1.0 – 0.2)]. Adjusting this amount for noncash items yields the net cash provided by operations. Depreciation is a noncash expense that should be added. To adjust for the difference between cost of goods sold and purchases, the inventory decrease is added (COGS exceeded purchases). To adjust for the difference between purchases and cash paid to suppliers, the increase in accounts payable is added (purchases exceeded cash paid to suppliers). The increase in accounts receivable is subtracted because it indicates that accrued revenues were greater than cash collections. Finally, the increase in accrued liabilities is added. Thus, the net cash provided by operations is $3,450 ($2,750 + $500 + $100 + $250 – $200 + $50).

Answer (D) is incorrect because the amount of $4,050 results from adding the $600 decrease in cash and marketable securities.

[Fact Pattern #56]
Rinker Corporation had 40,000 shares of common stock outstanding on November 30, Year 1. On May 20, Year 2, a 10% stock dividend was declared and distributed. On June 1, Year 2, Rinker issued options to its existing shareholders giving them the immediate right to acquire one additional share of stock for each share of stock held. The option price of the additional share was $6 per share, and no options have been exercised as of year end. The average price of Rinker’s common stock for the year was $20 per share. The price of the stock as of November 30, Year 2, the end of the fiscal year, was $30 per share, and the company’s net income for the fiscal year was $229,680. Rinker had no outstanding debt during the year, and its tax rate was 30%.

[308] (Refers to Fact Pattern #56)
The basic earnings per share (rounded to the nearest cent) of Rinker common stock for the fiscal year ended November 30, Year 2, was

A. $5.22 per share.
B. $3.82 per share.
C. $5.74 per share.
D. $3.38 per share.

Answer (A) is correct. BEPS is net income available to common shareholders divided by the weighted average number of common shares outstanding during the year. The denominator will include the 40,000 shares already outstanding plus the 4,000-share stock dividend (stock dividends and stock splits are deemed to have occurred at the beginning of the earliest period presented). Thus, 44,000 shares are considered to have been outstanding throughout the year. The stock options have no effect on the weighted-average shares outstanding because they were not exercised in the current period. BEPS is $5.22 ($229,680 ÷ 44,000).

Answer (B) is incorrect because BEPS is calculated by dividing net income available to common shareholders by the weighted average shares outstanding.

Answer (C) is incorrect because BEPS is calculated by dividing net income available to common shareholders by the weighted average shares outstanding.

Answer (D) is incorrect because BEPS is calculated by dividing net income available to common shareholders by the weighted average shares outstanding.
The diluted earnings per share (rounded to the nearest cent) of Rinker common stock for the fiscal year ended November 30, Year 2, was

A. $5.22 per share.  
B. $3.19 per share.  
C. $3.07 per share.  
D. $3.73 per share.

- Answer (A) is incorrect because DEPS equals net income available to common shareholders divided by the number of common shares outstanding after adjustment for all dilutive securities.  
- Answer (B) is incorrect because DEPS equals net income available to common shareholders divided by the number of common shares outstanding after adjustment for all dilutive securities.  
- Answer (C) is incorrect because DEPS equals net income available to common shareholders divided by the number of common shares outstanding after adjustment for all dilutive securities.  
- Answer (D) is correct. DEPS is net income available to common shareholders divided by the number of common shares outstanding after adjustment for all dilutive securities.

A drop in the market price of a firm’s common stock will immediately increase its

A. Return on equity.  
B. Dividend payout ratio.  
D. Dividend yield.

- Answer (A) is incorrect because The return on equity is based on the book value in its calculation rather than the market price of the common stock.  
- Answer (B) is incorrect because The dividend payout ratio is based on the book value in its calculation rather than the market price of the common stock.  
- Answer (C) is incorrect because The market-to-book ratio is based on the book value in its calculation rather than the market price of the common stock.  
- Answer (D) is correct. Dividend yield equals dividends per common share divided by the market price per common share. Hence, a drop in the market price of the stock will increase this ratio, holding all else constant.
Watson Corporation computed the following items from its financial records for the year:

- Price-earnings ratio: 12
- Payout ratio: 0.6
- Asset turnover ratio: 0.9

The dividend yield on Watson’s common stock is

A. 5.0%  
B. 7.2%  
C. 7.5%  
D. 10.8%

- **Answer (A) is correct.** Dividend yield is computed by dividing the dividend per share by the market price per share. The payout ratio (0.6) is computed by dividing dividends by net income per share (EPS). The P/E ratio (12) is computed by dividing the market price per share by net income per share. Thus, assuming that net income per share (EPS) is $X, the market price must be $12X and the dividends per share $.6X (.6 × X net income per share). Consequently, the dividend yield is 5.0% ($.6X dividend ÷ $12X market price per share).
- **Answer (B) is incorrect because This percentage equals 12% times the payout ratio.**
- **Answer (C) is incorrect because This percentage equals asset turnover divided by the P/E ratio.**
- **Answer (D) is incorrect because This percentage equals 12% times the asset turnover ratio.**

An increase in the market price of a company’s common stock will immediately affect its

A. Dividend yield  
B. Debt to equity ratio  
C. Earnings per share  
D. Dividend payout ratio

- **Answer (A) is correct.** The only common ratios that use market price as a part of the calculation are the price-earnings ratio and the dividend yield. The dividend yield is computed by dividing the annual dividend by the current market price. Thus, an increase in market price will decrease the dividend yield.
- **Answer (B) is incorrect because It is based on book value and is not influenced by market price.**
- **Answer (C) is incorrect because EPS equals income divided by the number of shares outstanding.**
- **Answer (D) is incorrect because The dividend payout ratio equals the annual dividend divided by income.**

For the most recent fiscal period, Oakland, Inc., paid a regular quarterly dividend of $0.20 per share and had earnings of $3.20 per share. The market price of Oakland stock at the end of the period was $40.00 per share. Oakland’s dividend yield was

A. 0.50%  
B. 10.00%  
C. 2.00%  
D. 6.25%

- **Answer (A) is incorrect because This percentage results from failing to recognize that the $0.20 dividend is for a single quarter.**
Answer (B) is incorrect because Ten percent results from improperly adding the $0.80 annual dividend and the $3.20 earnings per share to arrive at $4.00 for use as the numerator.

Answer (C) is correct. Dividend yield is the dividend per share divided by the market price. Oakland’s was thus 2% [(0.20 × 4) ÷ $40].

Answer (D) is incorrect because This percentage results from using earnings per share, rather than market price, in the denominator and using $0.20 as the annual dividend.

[314] The dividend yield ratio is calculated by which one of the following methods?

A. Market price per share divided by dividends per share.
B. Earnings per share divided by dividends per share.
C. Dividends per share divided by market price per share.
D. Dividends per share divided by earnings per share.

- Answer (A) is incorrect because Market price per share divided by dividends per share is the inverse of the dividend yield.
- Answer (B) is incorrect because Dividend yield is the dividend per share divided by the market price per share.
- Answer (C) is correct. Dividend yield is the dividend per share divided by the market price per share.
- Answer (D) is incorrect because Dividend yield is the dividend per share divided by the market price per share.

[315] Mayson Company reported net income of $350,000 for last year. The company had 100,000 shares of $10 par value common stock outstanding and 5,000 shares of common stock in treasury during the year. Mayson declared and paid $1 per share dividends on common stock. The market price per common share at the end of last year was $30. The company’s dividend yield for the year was

A. 30.03%
B. 28.57%
C. 11.11%
D. 3.33%

- Answer (A) is incorrect because The dividend yield is calculated by dividing the dividend per share ($1) by the market price per share ($30).
- Answer (B) is incorrect because The dividend yield is calculated by dividing the dividend per share ($1) by the market price per share ($30).
- Answer (C) is incorrect because The dividend yield is calculated by dividing the dividend per share ($1) by the market price per share ($30).
- Answer (D) is correct. Dividend yield is the dividend per share divided by the market price. Mayson’s was thus 3.33% ($1 ÷ $30).
Schodack, Inc.’s common stock has a market price of $25, a price-earnings ratio of 7.2, and a dividend yield of 5%. The earnings yield and dividend payout ratio, respectively, are closest to

<table>
<thead>
<tr>
<th>Earnings Yield</th>
<th>Dividend Payout Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 9%</td>
<td>36%</td>
</tr>
<tr>
<td>B. 9%</td>
<td>64%</td>
</tr>
<tr>
<td>C. 14%</td>
<td>36%</td>
</tr>
<tr>
<td>D. 14%</td>
<td>64%</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because the yield is almost 14% (1 ÷ 7.2).
- Answer (B) is incorrect because the payout ratio is only 36% ($1.25 ÷ $3.47).
- Answer (C) is correct. Schodack’s ratios can be calculated as follows:

  \[
  \text{Price-earnings ratio} = \frac{1}{\text{Earnings yield}}
  \]
  \[
  \text{Earnings yield} = \frac{1}{\text{Price-earnings ratio}}
  = \frac{1}{7.2}
  = 13.9\%
  \]

  \[
  \text{Dividends per share ÷ Market price per share} = \text{Dividend yield}
  \]
  \[
  \text{Dividends per share} = \text{Market price per share} \times \text{Dividend yield}
  = \$25 \times 5\%
  = \$1.25
  \]

  \[
  \text{Earnings per share ÷ Market price per share} = \text{Earnings yield}
  \]
  \[
  \text{Earnings per share} = \text{Market price per share} \times \text{Earnings yield}
  = \$25 \times 0.13889
  = \$3.472
  \]

  \[
  \text{Dividend payout ratio} = \frac{\text{Dividends per share} \div \text{Earnings per share}}
  = \frac{\$1.25 \div \$3.472}{36%}
  \]

- Answer (D) is incorrect because the payout ratio is only 36% ($1.25 ÷ $3.47).

---

**Fact Pattern #57**
The following information concerning Arnold Company’s common stock was included in the company’s financial reports for the last 2 years:

<table>
<thead>
<tr>
<th></th>
<th>Year 2</th>
<th>Year 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market price per share on December 31</td>
<td>$60</td>
<td>$50</td>
</tr>
<tr>
<td>Par value per share</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Earnings per share</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Dividends per share</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Book value per share on December 31</td>
<td>36</td>
<td>34</td>
</tr>
</tbody>
</table>
[317] (Refers to Fact Pattern #57)
Based on the price-earnings information, investors would most likely consider Arnold’s common stock to

A. Be overvalued at the end of Year 2.
B. Indicate inferior investment decisions by management in Year 2.
C. Show a positive trend in growth opportunities in Year 2 compared to Year 1.
D. Show a decline in growth opportunities in Year 2 compared to Year 1.

- Answer (A) is incorrect because An increase in the market/book ratio from 1.47 to 1.67 is not an indication of overvaluation.
- Answer (B) is incorrect because All indicators that changed showed positive change from Year 1 to Year 2.
- Answer (C) is correct. The only two valuation measures that changed were the market price of the stock and the book value per share, and they both experienced increases. Thus, Arnold’s asset base and financing structure expanded, and the market responded favorably. This indicates the company experienced healthy growth in Year 2.
- Answer (D) is incorrect because The indicators that changed showed increased growth opportunities.

[318] (Refers to Fact Pattern #57)
Arnold’s dividend yield in Year 2

A. Has increased compared to Year 1.
B. Is indicative of the company’s failure to provide a positive return to the investors.
C. Is the same as Year 1.
D. Has declined compared to Year 1.

- Answer (A) is incorrect because Arnold’s dividend yield fell from Year 1 to Year 2.
- Answer (B) is incorrect because Arnold did pay a dividend in Year 2.
- Answer (C) is correct. A firm’s net profit margin is its net income divided by net sales. Both figures are derived from the income statement and are thus unaffected by a purchase of treasury stock.
- Answer (D) is incorrect because The indicators that changed showed increased growth opportunities.

[319] Douglas Company purchased 10,000 shares of its common stock at the beginning of the year for cash. This transaction will affect all of the following except the

A. Debt to equity ratio.
B. Earnings per share.
C. Net profit margin.
D. Current ratio.

- Answer (A) is incorrect because A purchase of treasury stock changes a firm’s capital structure and thus affects the debt to equity ratio.
- Answer (B) is incorrect because A purchase of treasury stock changes a firm’s capital structure and thus affects earnings per share.
- Answer (C) is correct. A firm’s net profit margin is its net income divided by net sales. Both figures are derived from the income statement and are thus unaffected by a purchase of treasury stock.
- Answer (D) is incorrect because A purchase of treasury stock requires the outlay of cash and thus affects the current ratio.
Donovan Corporation recently declared and issued a 50% stock dividend. This transaction will reduce the company’s

A. Current ratio.
B. Book value per common share.
C. Debt to equity ratio.
D. Return on operating assets.

- Answer (A) is incorrect because Only equity accounts are affected by a stock dividend.
- Answer (B) is correct. A stock dividend capitalizes a portion of retained earnings, leaving the firm’s book value unchanged. Since more shares are outstanding after the dividend is distributed, the denominator of the book value per common share ratio is higher, driving the overall ratio down.
- Answer (C) is incorrect because A stock dividend merely involves moving an amount from one equity account to another, leaving the debt to equity ratio unchanged.
- Answer (D) is incorrect because Only equity accounts are affected by a stock dividend.

Mayson Ltd. reported net income of £3,500,000 for last year. The company had 100,000 shares of common stock outstanding with a par value of £1 and 5,000 shares of common stock in treasury during the year. Mayson declared and paid dividends of £1 per share on its common stock. The market price per common share at the end of last year was £30, while the book value per common share was £10. The company’s dividend yield for the year was

A. 10.00%
B. 5.00%
C. 3.33%
D. 2.71%

- Answer (A) is incorrect because The dividend yield is equal to the dividends per share divided by the market price per share. This answer choice incorrectly uses the book value per common share of 10 as the denominator instead of the market price.
- Answer (B) is incorrect because The dividend yield is equal to the dividends per share divided by the market price per share. This answer choice incorrectly divides the 5,000 shares of treasury stock by the 100,000 shares of common stock outstanding in order to calculate the dividend yield. These numbers are distractors in the question stem; they are not needed to answer the question.
- Answer (C) is correct. The dividend yield is equal to the dividends per share divided by the market price per share. Both of these figures are stated in the question stem. The dividend per share is given as £1, and the market price per common share is stated as £30 at the end of the last year. Therefore, the dividend yield is equal to 3.33% (£1 / £30). (There is a lot of excess information in the problem that is not needed to solve for the solution. Do not let this distract you.)
- Answer (D) is incorrect because The dividend yield is equal to the dividends per share divided by the market price per share. This answer choice incorrectly divides the outstanding common stock less the treasury shares by the net income. These numbers are distractors in the question stem; they are not needed to answer the question.
Marge Halifax, chief financial officer of Strickland Construction, has been tracking the activities of the company’s nearest competitor for several years. Among other trends, Halifax has noticed that this competitor is able to take advantage of new technology and bring new products to market more quickly than Strickland. In order to determine the reason for this, Halifax has been reviewing the following data regarding the two companies:

<table>
<thead>
<tr>
<th></th>
<th>Strickland</th>
<th>Competitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable turnover</td>
<td>6.85</td>
<td>7.35</td>
</tr>
<tr>
<td>Return on assets</td>
<td>15.34</td>
<td>14.74</td>
</tr>
<tr>
<td>Times interest earned</td>
<td>15.65</td>
<td>12.45</td>
</tr>
<tr>
<td>Current ratio</td>
<td>2.11</td>
<td>1.23</td>
</tr>
<tr>
<td>Debt/equity ratio</td>
<td>42.16</td>
<td>55.83</td>
</tr>
<tr>
<td>Degree of financial leverage</td>
<td>1.06</td>
<td>1.81</td>
</tr>
<tr>
<td>Price/earnings ratio</td>
<td>26.56</td>
<td>26.15</td>
</tr>
</tbody>
</table>

On the basis of this information, which one of the following is the best initial strategy for Halifax to follow in attempting to improve the flexibility of Strickland?

A. Seek cost cutting measures that would increase Strickland’s profitability.
B. Investigate ways to improve asset efficiency and turnover times to improve liquidity.
C. Seek additional sources of outside financing for new product introductions.
D. Increase Strickland’s investment in short-term securities to increase the current ratio.

- Answer (A) is incorrect because cutting costs makes it harder to take advantage of new opportunities or to innovate. Cost cutting is a last resort and Strickland’s return on assets is already better than its competitor’s.
- Answer (B) is incorrect because the receivables turnover is not much different than that of the competitor.
- Answer (C) is correct. Strickland’s times interest earned, debt/equity ratio, and degree of financial leverage all reveal that Strickland is less leveraged than its competitor. The two firms’ price-earnings ratios are comparable, so Strickland should be able to raise new capital fairly easily, either debt or equity. Thus, Strickland should seek additional sources of outside financing for new product introductions.
- Answer (D) is incorrect because increasing investment in short-term securities would not change the current ratio.

The capacity of the firm’s operations to produce cash inflows is

A. Earnings quality.
B. Earnings power.
C. Solvency.
D. Leverage.

- Answer (A) is incorrect because earnings quality is the precision of the “noise” term contained in earnings. It is the inverse of the variance in earnings.
- Answer (B) is correct. Earnings power is the capacity of the firm’s operations to produce cash inflows. A predictably stable pattern of earnings is the optimal source of funds for payment of long-term debt and other fixed charges.
- Answer (C) is incorrect because solvency is a firm’s long-term ability to meet its obligations.
- Answer (D) is incorrect because leverage is the degree of debt used in financing a business.
When calculating ratios involving income, an adjustment is most likely to be made for

A. Gross profit.
B. Selling expenses.
C. Nonrecurring gains and losses.
D. Fixed overhead costs.

- Answer (A) is incorrect because Income is less likely to be adjusted for recurring costs.
- Answer (B) is incorrect because Income is less likely to be adjusted for recurring costs.
- Answer (C) is correct. Nonrecurring gains and losses are sometimes added to or subtracted from income to arrive at income from continuing operations. Because ratios are used to predict the future, nonrecurring items not likely to recur should not be considered.
- Answer (D) is incorrect because Income is less likely to be adjusted for recurring costs.

Which of the following is an item with high earnings persistence?

A. Extraordinary gain.
B. Extraordinary loss.
C. Gain on disposal of old equipment.
D. Sales from a new product.

- Answer (A) is incorrect because This is an item with low earnings persistence.
- Answer (B) is incorrect because This is an item with low earnings persistence.
- Answer (C) is incorrect because This is an item with low earnings persistence.
- Answer (D) is correct. Additional revenue from a successful new product and lower costs attributable to improved operating efficiency are examples of high persistence items. Items of low persistence include extraordinary items or one-time or rare transactions such as gains and losses on disposals of capital assets. Zero-persistence items also exist, for example, the immediate expensing of intangibles.
Excerpts from the statement of financial position for Markham Corporation as of April 30 of the current year are presented as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$725,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>1,640,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>2,945,000</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$5,310,000</strong></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$1,236,000</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>831,000</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$2,067,000</strong></td>
</tr>
</tbody>
</table>

The board of directors of Markham met on May 5 of the current year and declared a quarterly cash dividend in the amount of $800,000 ($0.50 per share). The dividend was paid on May 28 of the current year to shareholders of record as of May 15 of the current year. Assume that the only transactions that affected Markham during May of the current year were the dividend transactions and that the closing entries have been made.

Markham’s total shareholders’ equity would be

A. Increased by the dividend declaration and unchanged by the dividend payment.
B. Unchanged by the dividend declaration and decreased by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Decreased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is incorrect because Shareholders’ equity is decreased by the declaration of a dividend, but the payment of a previously declared dividend has no effect on shareholders’ equity.
- Answer (B) is incorrect because Shareholders’ equity is decreased by the declaration of a dividend, but the payment of a previously declared dividend has no effect on shareholders’ equity.
- Answer (C) is incorrect because Shareholders’ equity is decreased by the declaration of a dividend, but the payment of a previously declared dividend has no effect on shareholders’ equity.
- Answer (D) is correct. The declaration of a dividend results in an increase in current liabilities and a corresponding decrease in retained earnings (a shareholders’ equity account). Thus, the declaration of a dividend decreases shareholders’ equity. The subsequent payment of the dividend has no effect on shareholders’ equity because that transaction involves using cash (a current asset) to pay the previously recorded current liability.
Grand Savings Bank has received loan applications from three companies in the plastics manufacturing business and currently has the funds to grant only one of these requests. Specific data shown below has been selected from these applications for review and comparison with industry averages.

<table>
<thead>
<tr>
<th></th>
<th>Springfield</th>
<th>Reston</th>
<th>Herndon</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sales (millions)</td>
<td>$4.27</td>
<td>$3.91</td>
<td>$4.86</td>
<td>$4.30</td>
</tr>
<tr>
<td>Net profit margin</td>
<td>9.55%</td>
<td>9.85%</td>
<td>10.05%</td>
<td>9.65%</td>
</tr>
<tr>
<td>Current ratio</td>
<td>1.82</td>
<td>2.02</td>
<td>1.96</td>
<td>1.95</td>
</tr>
<tr>
<td>Return on assets</td>
<td>12.0%</td>
<td>12.6%</td>
<td>11.4%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Debt/equity ratio</td>
<td>52.5%</td>
<td>44.6%</td>
<td>49.6%</td>
<td>48.3%</td>
</tr>
<tr>
<td>Financial leverage</td>
<td>1.30</td>
<td>1.02</td>
<td>1.56</td>
<td>1.33</td>
</tr>
</tbody>
</table>

Based on the information above, select the strategy that should be the most beneficial to Grand Savings.

A. Grand should not grant any loans, as none of these companies represents a good credit risk.
B. Grant the loan to Springfield, as all the company’s data approximate the industry average.
C. Grant the loan to Reston, as both the debt/equity ratio and degree of financial leverage are below the industry average.
D. Grant the loan to Herndon, as the company has the highest net profit margin and degree of financial leverage.

- Answer (A) is incorrect because Reston is a good credit risk.
- Answer (B) is incorrect because Debt makes up more than half of Springfield’s capital structure; “approximating industry averages” is meaningless when just a few percentage points can mean the difference between a good credit risk and a poor one.
- Answer (C) is correct. Grand’s primary concern is the customer’s ability to pay a loan back. Crucial in deciding the likelihood of payback is how much of the customer’s capital structure is made up of debt currently, that is, before the loan is made. Reston’s is well below the industry average (a few percentage points can mean the difference between a good credit risk and a poor one) and is the lowest of the three potential customers. Also, Reston is clearly the least leveraged of the three by far, as revealed by its low degree of financial leverage.
- Answer (D) is incorrect because While a high profit margin may be indicative of the ability to pay back a loan, a high degree of financial leverage indicates the opposite, and Herndon’s is well above the industry average.

A retail company has experienced rapid growth in sales during the current year. An analyst has calculated the following ratios for this company.

<table>
<thead>
<tr>
<th></th>
<th>Prior Year</th>
<th>Current Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory turnover</td>
<td>5.4</td>
<td>9.3</td>
</tr>
<tr>
<td>Receivables turnover</td>
<td>4.2</td>
<td>3.5</td>
</tr>
<tr>
<td>Fixed asset turnover</td>
<td>2.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Quick ratio</td>
<td>1.5</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Based on the above, the analyst may conclude that sales increased due to more

A. Competitive pricing.
B. Favorable credit policies.
C. Stores opening in the current year.
D. Control over inventory levels.
Answer (A) is incorrect because The analyst cannot conclude that sales increased due to more competitive pricing. Competitive pricing is employed by firms when they set the price of a product or service based on what the competition is charging. The facts in the question stem do not provide any information as to what the competition is using as their prices. Therefore, this would not be a good conclusion as to why the sales increased.

Answer (B) is correct. The analyst can conclude that sales increased due to more favorable credit policies. The inventory turnover ratio increased drastically, meaning that COGS increased, average inventory decreased, or both. At the same time, the receivables turnover decreased, meaning average accounts receivable increased. Sales did not decrease; the question stem explains that they increased. The increase in average accounts receivable and the decrease in inventory can best be explained by a more favorable credit policy because this would allow more customers to purchase from the company even if they lack the best credit standings.

Answer (C) is incorrect because The analyst cannot conclude that sales increased due to more stores opening in the current year. If stores opened in the current year, then the fixed asset turnover would have decreased, as the opening of a new store would require a large increase in fixed assets.

Answer (D) is incorrect because The analyst cannot conclude that sales increased due to more control over inventory levels. The inventory levels decreased because of the increase in sales. In addition, the quick ratio remains relatively the same. If there were more control over the inventory levels, then this ratio would have shown a greater change.

In assessing the financial prospects for a firm, financial analysts use various techniques. An example of vertical, common-size analysis is

A. An assessment of the relative stability of a firm’s level of vertical integration.
B. A comparison in financial ratio form between two or more firms in the same industry.
C. Advertising expense is 2% greater compared with the previous year.
D. Advertising expense for the current year is 2% of sales.

Answer (A) is incorrect because Vertical integration occurs when a corporation owns one or more of its suppliers or customers.

Answer (B) is incorrect because Vertical, common-size analysis restates financial statements amounts as percentages.

Answer (C) is incorrect because A statement that advertising expense is 2% greater than in the previous year results from horizontal analysis.

Answer (D) is correct. Vertical, common-size analysis compares the components within a set of financial statements. A base amount is assigned a value of 100%. For example, total assets on a common-size balance sheet and net sales on a common-size income statement are valued at 100%. Common-size statements permit evaluation of the efficiency of various aspects of operations. An analyst who states that advertising expense is 2% of sales is using vertical, common-size analysis.
Bisbee Corporation’s abbreviated common-size income statements for Year 1’s actual results and Year 2’s anticipated results are shown below.

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
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</thead>
<tbody>
<tr>
<td>Sales</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Selling and admin. exp</td>
<td>40%</td>
<td>?</td>
</tr>
<tr>
<td>Operating Income</td>
<td>10%</td>
<td>?</td>
</tr>
</tbody>
</table>

Bisbee estimates that units sold will increase by 5% in Year 2 with no price increase to its customers and no anticipated cost increases from its vendors. Assume selling and administrative expenses are 5% variable and 95% fixed. If all predictions materialize, Bisbee should expect selling and administrative expenses in Year 2 to be

A. Less than 40% of sales.
B. 40% of sales.
C. Greater than 40% but no more than 42% of sales.
D. Greater than 42% of sales.

- Answer (A) is correct. This question is best answered using actual numbers. Assume that sales in Year 1 are $500. Because total selling and administrative expenses are 40% of Year 1 sales, selling and administrative expenses equal $200 ($500 × 40%). Given that 5% of this is variable and 95% is fixed, variable expense equals $10 ($200 × 5%) and fixed expense equals $190 ($200 × 95%). In relation to sales, variable selling and administrative expenses are equal to 2% ($10 variable ÷ $500 sales) of sales. This percent will help calculate the variable selling and administrative expenses in Year 2.

In Year 2, sales increase by 5%, making Year 2 sales equal to $525 ($500 Year 1 sales × 1.05 increase). The fixed portion of the selling and administrative expenses is equal to $190. The variable portion can be solved by multiplying 2% by sales of $525, which results in $10.50. Therefore, total selling and administrative expenses are equal to $200.50, about 38.20% ($200.50 ÷ $525) of Year 2 sales, which is less than 40%.

- Answer (B) is incorrect because selling and administrative expenses are not the same in Year 2 as they were in Year 1.
- Answer (C) is incorrect because Year 2 selling and administrative expenses are not greater than 40% of sales.
- Answer (D) is incorrect because Year 2 selling and administrative expenses are not greater than 42% of sales.

Baldwin Corporation’s inventory expressed as a percentage of current assets increased from 25% last July to 35% this July. The factor that is least likely to cause this increase is that Baldwin

A. Is a seasonal company with traditionally higher activity in the summer months.
B. Is beginning to experience high growth.
C. Has inventory that is becoming obsolete.
D. Used a material amount of cash from selling its short-term investments to purchase land.

- Answer (A) is correct. This statement is least likely to explain an increase in current assets from last July to this July. If Baldwin was a seasonal company with traditionally higher activity in the summer months, it would budget similar amounts for each summer in expectation of the high activity. The sudden increase in current assets for the following summer would not be explained by the fact that they are a seasonal company.
- Answer (B) is incorrect because if Baldwin was beginning to experience high growth, it would have to purchase more inventory in order to meet the higher demand from the growth. This would cause the current assets account to increase.
- Answer (C) is incorrect because obsolete inventory refers to inventory held by a company that is at the end of its product life cycle and has not seen any sales or usage for a set period of time. If Baldwin has inventory that is becoming obsolete, the inventory will be held by the company instead of being sold. This would cause an increase in the current assets on the books.
Answer (D) is incorrect because it can be assumed that the sale of short-term investments generated a gain, which caused a bigger cash inflow than the outflow from the short-term investments. This means that the current assets account increased. The fact that the company bought land with some of the cash is meant as a distractor, as the question does not state how much of the cash was used to purchase the land.

[332] Which one of the following ratios would be most affected by miscellaneous or non-recurring income?

A. Net profit margin.
B. Operating profit margin.
C. Gross profit margin.
D. Debt-to-equity ratio.

Answer (A) is correct. Net profit margin is expressed as net income over sales. Net income would include miscellaneous or non-recurring income. This ratio would be the most affected because the amounts for miscellaneous or non-recurring income would be included in the numerator of the ratio.

Answer (B) is incorrect because Operating profit margin is equal to operating income divided by net sales. Neither sales nor operating income would include miscellaneous or non-recurring income. Therefore, this ratio would not be affected by those amounts.

Answer (C) is incorrect because Gross profit margin is expressed as gross profit divided by net sales. Gross profit is equal to revenues less the cost of goods sold, not including miscellaneous or non-recurring income. Therefore, this ratio would not be affected by those amounts.

Answer (D) is incorrect because The debt-to-equity ratio is expressed as total debt divided by stockholders’ equity. Neither debt nor stockholders’ equity would include miscellaneous or non-recurring income. Therefore, this ratio would not be affected by those amounts.

[333] A U.S. company and a German company purchased the same stock on the German stock exchange and held the stock for 1 year. The value of the euro weakened against the dollar over this period. Comparing the returns of the two companies, the United States company’s return will be

A. Lower.
B. Higher.
C. The same.
D. Indeterminate from the information provided.

Answer (A) is correct. The returns on the stock are presumably paid in euros. Hence, the change in the value of the euro relative to the dollar does not affect the German company’s return. However, the weakening of the euro reduces the number of dollars it will buy, and the U.S. company’s return in dollars is correspondingly reduced.

Answer (B) is incorrect because the return to the U.S. company is adversely affected by the exchange rate movement.

Answer (C) is incorrect because the return to the U.S. company was directly affected by the exchange rate movement, but the return to the German company was not.

Answer (D) is incorrect because the return to the U.S. company was directly affected by the exchange rate movement, but the return to the German company was not.
If an entity’s books of account are not maintained in its functional currency, U.S. GAAP require remeasurement into the functional currency prior to the translation process. An item that should be remeasured by use of the current exchange rate is

A. An investment in bonds to be held until maturity.
B. A plant asset and the associated accumulated depreciation.
C. A patent and the associated accumulated amortization.
D. The revenue from a long-term construction contract.

- **Answer (A) is correct.** When remeasurement is necessary, the temporal method is applied. The essence of the temporal method is to make the financial statement items look as if the underlying transactions had been recorded in the functional currency to begin with. Balance sheet items carried at their future values, such as held-to-maturity investments in bonds, are remeasured using the current rate on the reporting date.
- **Answer (B) is incorrect because Property, plant, and equipment is remeasured at the historical rate.**
- **Answer (C) is incorrect because Intangible assets are remeasured at the historical rate.**
- **Answer (D) is incorrect because Revenues, expenses, gains, and losses are remeasured using historical rates.**

U.S. GAAP require the application of the functional currency concept. Before the financial statements of a foreign subsidiary may be translated into the parent company’s currency, the functional currency of the foreign subsidiary must be determined. All of the following factors indicate that a foreign subsidiary’s functional currency is the foreign currency rather than the parent’s currency **except** when

A. Its cash flows are primarily in foreign currency and do not affect the parent’s cash flows.
B. Its sales prices are responsive to exchange rate changes and to international competition.
C. Its labor, material, and other costs are obtained in the local market of the foreign subsidiary.
D. Its financing is primarily obtained from local foreign sources and from the subsidiary’s operations.

- **Answer (A) is incorrect because Cash flows primarily being in that foreign currency that does not affect the parent’s cash flows is generally an indicator that the functional currency is the foreign currency.**
- **Answer (B) is correct.** A company’s functional currency is that of the primary economic environment in which an entity operates, i.e., the currency in which the company primarily generates and expends cash. Sales prices that are responsive to exchange rate fluctuations and international competition suggest that the functional currency is the parent’s currency.
- **Answer (C) is incorrect because Labor, material, and other costs being obtained in the local market of the foreign subsidiary is generally an indicator that the functional currency is the foreign currency.**
- **Answer (D) is incorrect because Subsidiary financing being obtained from local foreign sources and from the subsidiary’s operations is generally an indicator that the functional currency is the foreign currency.**

The economic effects of a change in foreign exchange rates on a relatively self-contained and integrated operation within a foreign country relate to the net investment by the reporting enterprise in that operation. Consequently, translation adjustments that arise from the consolidation of that operation

A. Directly affect cash flows but should not be reflected in income.
B. Directly affect cash flows and should be reflected in income.
C. Do not directly affect cash flows and should not be reflected in income.
D. Do not directly affect cash flows but should be reflected in income.

- **Answer (A) is incorrect because When an operation is relatively self-contained, the assumption is that translation adjustments do not affect cash flows.**
Answer (B) is incorrect because when an operation is relatively self-contained, the assumption is that translation adjustments do not affect cash flows. Additionally, translation adjustments should be included in other comprehensive income, not recognized in income.

Answer (C) is correct. When a foreign operation is relatively self-contained, the cash generated and expended by the entity is normally in the currency of the foreign country, and that currency is deemed to be the operation’s functional currency. Related translation adjustments do not directly affect the parent’s cash flows and are not reflected in net income.

Answer (D) is incorrect because translation adjustments should be included in other comprehensive income, not recognized in income.

[337] U.S. GAAP require that, in a highly inflationary economy, the financial statements of a foreign entity be remeasured as if the functional currency were the reporting currency. For this requirement, a highly inflationary economy is one that has:

A. An inflation rate of at least 33% in the most recent past year.
B. An inflation rate of at least 50% in the most recent past year.
C. An inflation rate of at least 100% in the most recent past year.
D. A cumulative inflation rate of at least 100% over a 3-year period.

Answer (A) is incorrect because U.S. GAAP define a highly inflationary economy as one that has an inflation rate of at least 100% over a 3-year period.

Answer (B) is incorrect because U.S. GAAP define a highly inflationary economy as one that has an inflation rate of at least 100% over a 3-year period.

Answer (C) is incorrect because U.S. GAAP define a highly inflationary economy as one that has an inflation rate of at least 100% over a 3-year period.

Answer (D) is correct. U.S. GAAP recognize that the currency in a highly inflationary economy is not stable enough to be a functional currency. Instead, the more stable currency of the parent corporation should be used as the functional currency. A highly inflationary economy has a cumulative inflation rate over a 3-year period of at least 100%.

[338] U.S. GAAP state that transaction gains and losses have direct cash flow effects when foreign-denominated monetary assets are settled in amounts greater or less than the functional currency equivalent of the original transactions. These transaction gains and losses should be reflected in income:

A. At the date the transaction originated.
B. On a retroactive basis.
C. In the period the exchange rate changes.
D. Only at the year-end balance sheet date.

Answer (A) is incorrect because the extent of any gain or loss cannot be known at the date of the original transaction.

Answer (B) is incorrect because retroactive recognition is not permitted.

Answer (C) is correct. A foreign currency transaction is one whose terms are denominated in a currency other than the entity’s functional currency. When a foreign currency transaction gives rise to a receivable or a payable that is fixed in terms of the amount of foreign currency to be received or paid, a change in the exchange rate between the functional currency and the currency in which the transaction is denominated results in a gain or loss that is included as a component of income from continuing operations in the period in which the exchange rate changes.

Answer (D) is incorrect because gains and losses are to be recognized in the period of the rate change.
U.S. GAAP define foreign currency transactions as those denominated in other than an entity’s functional currency. Transaction gains and losses are reported as:

A. Extraordinary items.
B. Adjustments to the beginning balance of retained earnings.
C. A component of equity.
D. A component of income from continuing operations.

- Answer (A) is incorrect because Transaction gains (losses) are not so unusual as to warrant extraordinary status.
- Answer (B) is incorrect because Adjustments to retained earnings are made only for prior-period adjustments, and transaction gains (losses) do not meet the criteria for such treatment.
- Answer (C) is incorrect because Foreign currency translation gains and losses (not transaction gains and losses) are reported in other comprehensive income, a component of equity.
- Answer (D) is correct. When a foreign currency transaction gives rise to a receivable or a payable, a change in the exchange rate between the measurement currency and the currency in which the transaction is denominated is a foreign currency transaction gain or loss that should be included as a component of income from continuing operations.

U.S. GAAP require the use of different methods to translate or remeasure foreign currency financial statements. When the foreign affiliate’s functional currency is not the reporting currency of the parent (or investor), the

A. Current/noncurrent method should be used to translate the foreign affiliate’s financial statements.
B. Monetary/nonmonetary method should be used to translate the foreign affiliate’s financial statements.
C. Temporal method should be used to remeasure the foreign affiliate’s financial statements.
D. Current exchange rate method should be used to translate the foreign affiliate’s financial statements.

- Answer (A) is incorrect because The current/noncurrent (temporal) method is used in the remeasurement, not translation.
- Answer (B) is incorrect because “Monetary/nonmonetary method” is not a meaningful term in this context.
- Answer (C) is incorrect because The restatement of the affiliate’s financial statement in the parent’s reporting currency is the process of translation (not remeasurement) in which the all-current method is used.
- Answer (D) is correct. When the foreign affiliate’s functional currency is not the reporting currency of the parent, the affiliate’s financial statements must be translated into the reporting currency using the all-current method.

Unrealized foreign currency gains and losses included in the other comprehensive income section of a consolidated balance sheet represent

A. Foreign currency transaction gains and losses.
B. The amount resulting from translating foreign currency financial statements into the reporting currency.
C. Remeasurement gains and losses.
D. Accounting not in accordance with U.S. generally accepted accounting principles.

- Answer (A) is incorrect because Transaction gains and losses (as opposed to translation gains and losses) are recognized in the income statement as they occur.
- Answer (B) is correct. U.S. GAAP require that foreign currency translation adjustments resulting from translation of an entity’s financial statements into the reporting currency be reported on the balance sheet in other comprehensive income.
- Answer (C) is incorrect because Remeasurement gains and losses are included in net income.
- Answer (D) is incorrect because The practice described is in accordance with U.S. GAAP.
When restating financial statements originally recorded in a foreign currency,

A. Income taxes are ignored in calculating and disclosing the results of foreign currency translations.
B. A component of annual net income, “Adjustment from Foreign Currency Translation,” should be presented in the notes to the financial statements or in a separate schedule.
C. The aggregate transaction gain or loss included in net income should be disclosed in the financial statements or in the notes to the financial statements.
D. The financial statements should be adjusted for a rate change that occurs after the financial statement date but prior to statement issuance.

- Answer (A) is incorrect because Allocation of income tax expense is required, including those income taxes related to translation adjustments and those transaction gains and losses recorded in a separate component of equity.
- Answer (B) is incorrect because The adjustment for foreign currency translation is reported in other comprehensive income.
- Answer (C) is correct. Foreign currency transaction gains or losses are ordinarily recognized in the income statement of the period in which the exchange rate changes. Accordingly, the aggregate transaction gain or loss included in earnings should be disclosed.
- Answer (D) is incorrect because An enterprise’s financial statements are not adjusted for rate changes after their effective date or after the date of foreign currency statements of a foreign entity if they are consolidated, combined, or accounted for under the equity method in the enterprise’s financial statements.

Formerly, there was significant disagreement among informed observers regarding the basic nature, information content, and meaning of results produced by various methods of translating amounts from foreign currencies into the reporting currency. Current U.S. GAAP direct that organizations

A. Change the accounting model to recognize currently the effects of all changing prices in the primary statements.
B. Defer any recognition of changing currency prices until they are realized by an actual exchange of foreign currency into the reporting currency.
C. Recognize currently the effect of changing currency prices on the carrying amounts of designated foreign assets and liabilities.
D. Recognize currently the effect of changing currency prices on the carrying amounts of all foreign assets, liabilities, revenues, expenses, gains, and losses.

- Answer (A) is incorrect because The primary financial statements are based on historical cost and nominal dollar accounting. They do not reflect changes in general or specific price levels, except for changes in foreign exchange rates.
- Answer (B) is incorrect because U.S. GAAP ordinarily require immediate recognition of changes in exchange rates.
- Answer (C) is incorrect because U.S. GAAP also apply to revenues, expenses, gains, and losses.
- Answer (D) is correct. The functional currency translation approach is appropriate for use in accounting for and reporting the financial results and relationships of foreign subsidiaries in consolidated statements. It involves identifying the functional currency of the entity (the currency of the primary economic environment in which the entity operates), measuring all elements of the financial statements in the functional currency, and using a current exchange rate for translation from the functional currency to the reporting currency.
The Brinjac Company owns a foreign subsidiary. Included among the subsidiary’s liabilities for the year just ended are 400,000 drongos of revenue received in advance, recorded when $.50 was the dollar equivalent per drongo, and a deferred tax liability for 187,500 drongos, recognized when $.40 was the dollar equivalent per drongo. The rate of exchange in effect at year-end was $.35 per drongo. If the U.S. dollar is the functional currency, what total should be included for these two liabilities on Brinjac’s consolidated balance sheet at year end?

A. $205,625  
B. $215,000  
C. $265,625  
D. $275,000

- Answer (A) is incorrect because Applying the year-end rate to the total liabilities results in $205,625.
- Answer (B) is incorrect because The historical, not current, rate should be used to remeasure the deferred income.
- Answer (C) is incorrect because The historical rate is used to remeasure nonmonetary balance sheet items, including deferred tax assets and liabilities.
- Answer (D) is correct. When a foreign entity’s functional currency is the U.S. dollar, the financial statements of the entity recorded in a foreign currency must be remeasured in terms of the U.S. dollar. Revenue received in advance (deferred income) is considered a nonmonetary balance sheet item and is translated at the applicable historical rate (400,000 drongos × $.50 per drongo = $200,000). Deferred charges and credits (except policy acquisition costs for life insurance companies) are also remeasured at historical exchange rates. The deferred tax liability (a deferred credit) should be remeasured at the historical rate (187,500 drongos × $.40 per drongo = $75,000). The total for these liabilities is therefore $275,000 ($200,000 + $75,000).

Freezel., Inc., is a manufacturer of refrigeration systems based out of the United States with one subsidiary in Canada. The Canadian subsidiary exports all of its manufactured products to the United States and does not currently sell any of its manufactured products in Canada. The Canadian subsidiary incurs all of its expenses in Canadian dollars, and all of its revenues are in U.S. dollars. The U.S. operations are conducted only in U.S. dollars. What financial impact will a rise in the Canadian dollar against the U.S. dollar have on the Canadian subsidiary assuming no operational changes?

A. A reduction in expenses.  
B. A reduction in revenues.  
C. An increase in cash flows.  
D. An increase in profit margins.

- Answer (A) is incorrect because A rise in the Canadian dollar against the U.S. dollar will not cause a reduction in expenses. The Canadian subsidiary incurs all of its expenses in Canadian dollars. Therefore, the appreciation in value of the Canadian dollar will cause the expenses to increase, not decrease.
- Answer (B) is correct. A rise in the Canadian dollar against the U.S. dollar will cause a reduction in revenues. Because the Canadian subsidiary exports all of its manufactured products to the U.S., does not currently sell any of its products in Canada, and has all of its revenues in U.S. dollars, the functional currency can be said to be the U.S. dollar. A rise in the Canadian dollar against the U.S. dollar means that the Canadian dollar has appreciated in value against the U.S. dollar. This also means that the U.S. dollar has depreciated in value against the Canadian dollar. The rise in the Canadian dollar against the U.S. dollar will cause a reduction in revenues because the U.S. dollar has depreciated in value and the subsidiary’s revenues are stated in U.S. dollars.
- Answer (C) is incorrect because A rise in the Canadian dollar against the U.S. dollar will not cause an increase or a decrease in cash flows. This rise would not affect the cash flows of the Canadian subsidiary.
- Answer (D) is incorrect because Because all of the subsidiary’s revenues are in U.S. dollars, the rise in the Canadian dollar against the U.S. dollar will cause a reduction in revenues because the U.S. dollar has depreciated in value. The Canadian subsidiary incurs all of its expenses in Canadian dollars. Therefore, the appreciation in value of the Canadian dollar will cause the expenses to increase. This decrease in revenues coupled with an increase in expenses will cause profit margins to decrease, not increase.
Leases should be classified by the lessee as either operating leases or capital leases. Which of the following statements best characterizes operating leases?

A. The benefits and risks of ownership are transferred from the lessor to the lessee.
B. The lessee records leased property as an asset and the present value of the lease payments as a liability.
C. Operating leases transfer ownership to the lessee, contain a bargain purchase option, are for more than 75% of the leased asset’s useful life, or have minimum lease payments with a present value in excess of 90% of the fair value of the leased asset.
D. The lessor records lease revenue, asset depreciation, maintenance, etc., and the lessee records lease payments as rental expense.

- Answer (A) is incorrect because when the benefits and risks of ownership are transferred from the lessor to the lessee, the transaction is a capital lease.
- Answer (B) is incorrect because it describes the proper accounting for a lessee’s capital lease.
- Answer (C) is incorrect because satisfaction of any one of these four criteria requires the lease to be treated as a capital lease.
- Answer (D) is correct. Operating leases are transactions whereby lessees rent the right to use lessor assets without acquiring a substantial portion of the benefits and risks of ownership of those assets.

Careful reading of an annual report will reveal that off-balance-sheet debt includes

A. Amounts due in future years under operating leases.
B. Transfers of accounts receivable without recourse.
C. Current portion of long-term debt.
D. Amounts due in future years under capital leases.

- Answer (A) is correct. Off-balance-sheet debt includes any type of liability for which the company is responsible but that does not appear on the balance sheet. The most common example is the amount due in future years on operating leases. Under U.S. GAAP, operating leases are not capitalized; instead, only the periodic payments of rent are reported when actually paid. Capital leases (those similar to a purchase) must be capitalized and reported as liabilities.
- Answer (B) is incorrect because transfers of accounts receivable without recourse do not create a liability for the company. This transaction is simply a transfer of receivables for cash.
- Answer (C) is incorrect because the current portion of long-term debt is shown on the balance sheet as a current liability.
- Answer (D) is incorrect because amounts due in future years under capital leases are required to be recognized under U.S. GAAP.

The International Accounting Standards Board (IASB)

A. Directly influences governmental legislation regarding accounting standards.
B. Develops binding pronouncements for its members.
C. Meets in private to encourage open and honest discussion.
D. Establishes uniform accounting standards to eliminate reporting differences among nations.

- Answer (A) is incorrect because the IASB has no direct influence on governmental legislation.
- Answer (B) is incorrect because the IASB’s authority is restricted to the willingness of participating and other countries to adopt its standards.
Answer (C) is incorrect because all meetings of the IASB are held in public and webcast.
Answer (D) is correct. Of the four principal objectives listed by the IFRS Foundation, the first is "to develop a single set of high quality, understandable, enforceable and globally accepted international financial reporting standards (IFRS) through its standard-setting body, the IASB." However, IASB pronouncements are not binding.

[349] Which of the following statements regarding International Financial Reporting Standards (IFRS) is false? IFRS

- A. Are required as GAAP in member countries.
- B. Are intended to lead to harmonization of principles.
- C. Are formulated by a body that engages with interested parties around the world.
- D. Cannot be enforced by the IASB.

Answer (A) is incorrect. IFRS are designed to lead to harmonization of principles worldwide, but ratified standards are not mandatory. The IASB has no enforcement authority.
Answer (B) is incorrect because IFRS are intended to lead to harmonization of principles.
Answer (C) is incorrect because The IASB, which formulates IFRS, engages closely with stakeholders around the world, including investors, analysts, regulators, and others.
Answer (D) is incorrect because IFRS cannot be enforced by the IASB.

[350] Although accounting principles worldwide have begun to converge, wide differences in practices remain among various countries. Which of the following is not one of these areas of concern?

- A. The definition of extraordinary items.
- B. The treatment of revaluation of fixed assets.
- C. The acceptance of FIFO for inventory measurement purposes.
- D. Requirements for conformity between tax accounting and financial statement accounting.

Answer (A) is incorrect because An area of concern due to the lack of harmonization is the definition of extraordinary items.
Answer (B) is incorrect because An area of concern due to the lack of harmonization is the treatment of revaluation of fund assets.
Answer (C) is correct. FIFO inventory measurement is accepted worldwide. LIFO is not.
Answer (D) is incorrect because An area of concern due to the lack of harmonization is conformity between tax accounting and financial statement accounting.

[351] Which of the following statements is true about revenue recognition from a long-term construction contract when the outcome of the construction contract or the stage of completion cannot be estimated reliably?

- A. Under IFRS, the revenue is recognized in accordance with the percentage-of-completion method.
- B. Under U.S. GAAP, the revenue is recognized in accordance with the percentage-of-completion method.
- C. Under U.S. GAAP, the revenue is recognized in accordance with the completed-contract method.
- D. Under IFRS, the revenue is recognized in accordance with the completed-contract method.
Answer (A) is incorrect because When the outcome a transaction involving the rendering of services (e.g., a construction project) cannot be estimated reliably, revenue must be recognized only to the extent of the expenses recognized that are recoverable. If it is probable that the entity will recover the transaction costs incurred, revenue is recognized only to the extent of those costs that are expected to be recoverable.

Answer (B) is incorrect because When the stage of completion cannot be reasonably estimated, the percentage-of-completion method is inappropriate. The revenue is recognized based on the completed-contract method.

Answer (C) is correct. Under U.S. GAAP, when the percentage-of-completion method is inappropriate because the outcome of a construction contract or the stage of completion cannot be reasonably estimated, the revenue is recognized based on the completed-contract method.

Answer (D) is incorrect because Under IFRS, the completed-contract method is not permitted.

[352] Under IFRS, an entity that acquires an intangible asset may use the revaluation model for subsequent measurement only if

A. The useful life of the intangible asset can be reliably determined.
B. An active market exists for the intangible asset.
C. The cost of the intangible asset can be measured reliably.
D. The intangible asset is a monetary asset.

- Answer (A) is incorrect because An intangible asset may have an indefinite life.
- Answer (B) is correct. An intangible asset is carried at cost minus any accumulated amortization and impairment losses, or at a revalued amount. The revaluation model is similar to that for items of PPE (initial recognition of an asset at cost). However, fair value must be determined based on an active market.
- Answer (C) is incorrect because Initial recognition of an intangible asset is at cost. Recognition is permitted only when it is probable that the entity will receive the expected economic benefits, and the cost is reliably measurable.
- Answer (D) is incorrect because An intangible asset is nonmonetary.

[353] Which of the following statements is correct regarding research and development (R&D) costs that were incurred during the internal project to create a patent?

A. Under U.S. GAAP, these costs may be capitalized and recognized as an intangible asset.
B. Under U.S. GAAP, development costs must be expensed as incurred, while research costs may be capitalized and recognized as an intangible asset.
C. Under IFRS, these costs must be expensed as incurred.
D. Under IFRS, research costs must be expensed as incurred, while development costs may be capitalized and recognized as an intangible asset.

- Answer (A) is incorrect because Under U.S. GAAP, R&D costs are expensed as incurred and are not capitalized.
- Answer (B) is incorrect because Under U.S. GAAP, R&D costs are expensed as incurred and are not capitalized.
- Answer (C) is incorrect because Under IFRS, development costs may be capitalized if certain conditions are met.
Answer (D) is correct. Under IFRS, (1) costs incurred during the research phase of an internal project are expensed as incurred since the company cannot demonstrate that an intangible asset exists that will generate probable future economic benefits; and (2) Costs incurred during the development phase of an internal project can be capitalized and recognized as an intangible asset if, and only if, the company can demonstrate all of the following:

- The technical feasibility to complete the intangible asset
- Its intention to complete and use or sell the intangible asset
- Its ability to sell or use the intangible asset
- Availability of resources to complete and use or sell the intangible asset
- The way in which the asset will generate probable future economic benefits
- Its ability to reliably measure expenditures attributable to the asset

[354] Which inventory cost flow method is prohibited according to IFRS?

A. First-in, first-out (FIFO) method.
B. Specific identification method.
C. Weighted average cost method.
D. Last-in, first-out (LIFO) method.

- Answer (A) is incorrect because The first-in, first-out method is permitted by IFRS.
- Answer (B) is incorrect because The specific identification method is permitted by IFRS.
- Answer (C) is incorrect because The weighted average cost method is permitted by IFRS.
- Answer (D) is correct. The last-in, first-out (LIFO) method is prohibited by IFRS. This method is based on the assumption that the newest items are sold first. Its effect is to include current prices in cost of goods sold. But the LIFO assumption ordinarily does not match actual inventory use.

[355] A company determined the following values for its inventory as of the end of the fiscal year:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical cost</td>
<td>$100,000</td>
</tr>
<tr>
<td>Current replacement cost</td>
<td>70,000</td>
</tr>
<tr>
<td>Net realizable value</td>
<td>90,000</td>
</tr>
<tr>
<td>Net realizable value minus a normal profit margin</td>
<td>85,000</td>
</tr>
<tr>
<td>Fair value</td>
<td>95,000</td>
</tr>
</tbody>
</table>

Under IFRS, what amount should the company report as inventory on its balance sheet?

A. $70,000
B. $85,000
C. $90,000
D. $95,000

- Answer (A) is incorrect because Current replacement cost ($70,000) is neither cost nor NRV.
- Answer (B) is incorrect because The lower of cost or market ($85,000) is the appropriate measure under GAAP.
- Answer (C) is correct. Inventory is measured at the lower of cost or NRV (estimated selling price in the ordinary course of business − estimated costs of completion and sale). Given cost of $100,000 and NRV of $90,000, inventory should be reported at $90,000. The write-down of $10,000 is recognized as a loss in the current period.
- Answer (D) is incorrect because Fair value is greater than NRV.
According to IFRS, a write-down of inventory is recognized in <List A>, and it <List B> reversed in subsequent periods.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Profit or loss</td>
<td>May be</td>
</tr>
<tr>
<td>B. Other comprehensive income</td>
<td>Must not be</td>
</tr>
<tr>
<td>C. Equity (directly)</td>
<td>May be</td>
</tr>
<tr>
<td>D. Profit or loss</td>
<td>Must not be</td>
</tr>
</tbody>
</table>

- Answer (A) is correct. Under IFRS, a write-down of inventory may be reversed in subsequent periods but not above the original cost. The write-down and reversal of inventory are recognized in profit or loss.
- Answer (B) is incorrect because a write-down of inventory is recognized in profit or loss, not in OCI, and it may be reversed in subsequent periods.
- Answer (C) is incorrect because the write-down of inventory is recognized initially as a loss in profit or loss. Thus, it decreases retained earnings (an equity amount), only indirectly.
- Answer (D) is incorrect because Under IFRS, a write-down of inventory may be reversed in subsequent periods but not above original cost.

Which of the following statements is correct regarding leases involving land and buildings?

A. Under U.S. GAAP, land and building elements must be accounted for separately.
B. Under U.S. GAAP, if the land component is bigger than the building component, these two components must be accounted for as a single unit.
C. Under IFRS, land and building components are generally accounted for separately.
D. Under IFRS, land and building components are accounted for as a single unit if the fair value of the land is less than 25% of the total fair value of the lease.

- Answer (A) is incorrect because Under U.S. GAAP, land and building components usually are accounted for as a single unit unless the land constitutes more than 25% of the total fair value of the lease.
- Answer (B) is incorrect because Under U.S. GAAP, the land and building components are accounted for as a single unit unless the land constitutes more than 25% of the total fair value of the lease.
- Answer (C) is correct. Under IFRS, in leases involving land and buildings, the land and building elements are accounted for separately except for rare cases where the land element is not material.
- Answer (D) is incorrect because Under IFRS, the land and building components are accounted for as a single unit only if the land component is not material.

Which of the following statements is false about an item of property, plant, and equipment (PPE)?

A. Under U.S. GAAP, such an item may be carried at an amount above its historical cost.
B. Under IFRS, such an item may be carried at an amount above its historical cost.
C. Under IFRS, such an item may be carried at its fair value.
D. Under U.S. GAAP, such an item may be carried at its historical cost.

- Answer (A) is correct. Under U.S. GAAP, items of PPE cannot be carried above their historical cost. They are carried at historical cost minus accumulated depreciation and impairment losses.
Answer (B) is incorrect because Under IFRS, according to the revaluation model, an item of PPE is carried at its revalued amount, which can be greater than the historical cost.

Answer (C) is incorrect because Under IFRS, according to the revaluation model, an item of PPE is measured at fair value on the revaluation date.

Answer (D) is incorrect because If an item of PPE is acquired on the financial reporting date, it is carried at its historical cost because depreciation of the item has not yet begun.

[359] Under IFRS, if a company chooses to account for its long-lived assets in accordance with the revaluation model, the recoverable amount of an asset is

A. The higher of an asset’s value in use or its fair value minus costs to sell.
B. The estimated selling price in the ordinary course of business minus the estimated costs of completion and the estimated costs necessary to make the sale.
C. The present value of the future cash flows expected to be derived from an asset.
D. The amount obtainable from the sale of an asset in an arm’s length transaction between knowledgeable, willing parties, minus the costs of disposal.

Answer (A) is correct. Any indication that an asset may be impaired requires the entity to estimate its recoverable amount. The recoverable amount is the higher of an asset’s fair value minus costs to sell and its value in use. Value in use is the present value of estimated future cash flows expected from (1) continuing use of an asset and (2) its disposal at the end of its useful life. Fair value minus costs to sell is the amount obtainable from the sale of an asset in an arm’s length transaction between knowledgeable, willing parties, minus costs of disposal.

Answer (B) is incorrect because The estimated selling price in the ordinary course of business minus the estimated costs of completion and the estimated costs necessary to make the sale is the net realizable value.

Answer (C) is incorrect because The present value of the future cash flows expected to be derived from an asset is the value in use.

Answer (D) is incorrect because Under IFRS, the amount obtainable from the sale of an asset in an arm’s length transaction between knowledgeable, willing parties, minus the costs of disposal, is the fair value minus costs to sell, not the recoverable amount.

[360] Under IFRS, when an indication of impairment exists, an impairment loss on a long-lived asset is measured as the difference between the <List A> and the <List B>.

<table>
<thead>
<tr>
<th></th>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Carrying amount</td>
<td>Recoverable amount</td>
</tr>
<tr>
<td>B.</td>
<td>Historical cost</td>
<td>Net realizable value</td>
</tr>
<tr>
<td>C.</td>
<td>Historical cost</td>
<td>Value in use</td>
</tr>
<tr>
<td>D.</td>
<td>Carrying amount</td>
<td>Undiscounted expected future</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cash flows from an asset</td>
</tr>
</tbody>
</table>

Answer (A) is correct. Under IFRS, the entity assesses at each reporting date whether an indication of impairment exists. Given such an indication, IFRS requires a one-step impairment test. The carrying amount of an asset is compared with its recoverable amount. An impairment loss is recognized when the carrying amount exceeds the recoverable amount. Thus, the impairment loss equals the carrying amount minus the recoverable amount.

Answer (B) is incorrect because According to IFRS, inventories, not long-lived assets, are measured at the lower of cost and NRV.
Answer (C) is incorrect because Under IFRS, an impairment loss on a long-lived asset is measured as the difference between the carrying amount of the asset (not historical cost) and its recoverable amount (not value in use). The value in use is one of two possible measures of the recoverable amount.

Answer (D) is incorrect because Under U.S. GAAP, the first step in the impairment test is to assess whether the carrying amount of an asset may not be recoverable by comparing its carrying amount with the undiscounted expected future cash flows from the asset.

On December 31, Year 1, a company determined the following information for a long-lived asset:

Carrying amount: $80,000
Fair value: 78,000
Cost to sell: 3,000
Value in use: 74,000
Undiscounted expected future cash flows: 77,000

What amount of impairment loss should the company recognize in the year-end financial statements under U.S. GAAP and IFRS?

<table>
<thead>
<tr>
<th>U.S. GAAP</th>
<th>IFRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. $2,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>B. $5,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>C. $6,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>D. $3,000</td>
<td>$2,000</td>
</tr>
</tbody>
</table>

Answer (A) is correct. According to U.S. GAAP, an impairment test requires two steps. First, the carrying amount is compared with the undiscounted cash flows expected from the asset. If the carrying amount ($80,000) is greater than the undiscounted expected cash flows from the asset ($77,000), an impairment loss is recognized. It is the excess of the carrying amount ($80,000) over the fair value ($78,000). Accordingly, the impairment loss equals $2,000 ($80,000 – $78,000). Under IFRS, an impairment loss equals the excess of the carrying amount of the asset ($80,000) over its recoverable amount. The recoverable amount of the asset is the greater of its fair value minus costs to sell ($78,000 – $3,000 = $75,000) or its value in use ($74,000). Therefore, the recoverable amount of the asset is $75,000, and the impairment loss is $5,000 ($80,000 – $75,000).

Answer (B) is incorrect because Under U.S. GAAP, when the carrying amount of a long-lived asset is not recoverable, the impairment loss is the difference between (1) the carrying amount and (2) fair value, not fair value minus costs to sell. Under IFRS, the recoverable amount of an asset is the greater, not the lesser, of its fair value minus costs to sell or value in use.

Answer (C) is incorrect because Under U.S. GAAP, an impairment loss is not the excess of the carrying amount of an asset over its value in use. Under IFRS, an impairment loss is the excess of the carrying amount over the recoverable amount. This amount is the greater of (1) fair value minus costs to sell and (2) value in use.

Answer (D) is incorrect because Under U.S. GAAP, the first step in the impairment test is to compare the carrying amount of the asset with the undiscounted expected future cash flows from the asset. If the carrying amount is not recoverable, an impairment loss is recognized for the difference between the carrying amount and the fair value of the asset. The amount of $2,000 is the impairment loss recognized under U.S. GAAP, not IFRS.

Which of the following statements is true regarding impairment of long-lived assets?

A. U.S. GAAP require a one-step impairment test, and IFRS requires a two-step impairment test.
B. Both IFRS and U.S. GAAP permit reversal of an impairment loss in subsequent periods.
C. Both IFRS and U.S. GAAP prohibit reversal of an impairment loss in subsequent periods.
D. Under U.S. GAAP, but not IFRS, reversal of an impairment loss in subsequent periods is prohibited.
Answer (A) is incorrect because U.S. GAAP require a two-step impairment test, and IFRS requires a one-step impairment test.
Answer (B) is incorrect because Under U.S. GAAP, a previously recognized impairment loss may not be reversed.
Answer (C) is incorrect because Under IFRS, an impairment loss may be reversed in subsequent periods.
Answer (D) is correct. Under IFRS, an impairment loss on an asset may be reversed in subsequent periods if a change in the estimates used to measure the recoverable amount has occurred. But an impairment loss recognized for goodwill must not be reversed. Under U.S. GAAP, a previously recognized impairment loss must not be reversed.

A company that operates in New York City incurred hurricane damage of $10 million. How is this loss reported in the financial statements prepared under IFRS and U.S. GAAP?

A. Under IFRS and U.S. GAAP as an extraordinary item.
B. Under IFRS and U.S. GAAP as a loss from continuing operations.
C. Under IFRS and U.S. GAAP as an item of other comprehensive income (OCI).
D. Under U.S. GAAP as an extraordinary item and under IFRS as an other expense in the continuing operations section.

Answer (A) is incorrect because Under IFRS, no items are classified as extraordinary.
Answer (B) is incorrect because Under U.S. GAAP, this loss is reported as an extraordinary item. It is unusual in nature and infrequent in occurrence in the environment in which the company operates.
Answer (C) is incorrect because A loss as a result of a hurricane must not be classified as an item of OCI. Instead, it must be recognized in the income statement as an extraordinary item under U.S. GAAP or as a loss from continuing operations under IFRS.
Answer (D) is correct. The $10 million loss as a result of a hurricane is a material transaction that is (1) unusual in nature and (2) infrequent in occurrence in the environment in which the entity operates. Thus, under U.S. GAAP, this loss is reported as an extraordinary item in the income statement. Under IFRS, no items are classified as extraordinary. Accordingly, this loss is reported as an other expense in the continuing operations section of the income statement.

Blake Ltd. has determined that an impairment exists on one of its machines, but the company expects to continue using the asset for another 3 full years as no active market exists for the machine. Selected information on the impaired asset (on the date that impairment was determined to exist) is provided below.

<table>
<thead>
<tr>
<th>Original cost of the machine</th>
<th>£ 22,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book (carrying) value of the machine</td>
<td>20,000</td>
</tr>
<tr>
<td>Value in use</td>
<td>15,000</td>
</tr>
<tr>
<td>Net selling price</td>
<td>12,000</td>
</tr>
</tbody>
</table>

According to IFRS, what is the amount of the impairment loss to be recorded by Blake?

A. £3,000
B. £5,000
C. £7,000
D. £8,000

Answer (A) is incorrect because The amount of £3,000 incorrectly subtracts the net selling price from the value in use in order to calculate the loss. Under IFRS, the loss is equal to the excess of the carrying amount over the recoverable amount.
Answer (B) is correct. Under IFRS, the carrying amount of the asset is compared with its recoverable amount. The recoverable amount is the greater of the asset’s fair value less cost to sell or value in use. An impairment loss is recognized equal to the excess of the carrying amount over the recoverable amount.

Blake’s recoverable amount is the value in use of £15,000 (the greater of £15,000 or £12,000). Therefore, the impairment loss under IFRS is equal to £5,000 (£20,000 carrying amount – £15,000 recoverable amount).

Answer (C) is incorrect because The amount of £7,000 incorrectly compares the original cost of the machine, instead of the carrying value, to the recoverable amount in order to calculate the loss. This treatment is not correct under IFRS.

Answer (D) is incorrect because The amount of £7,000 incorrectly uses the net selling price as the recoverable amount. The recoverable amount is the greater of an asset’s fair value less cost to sell or value in use. Because the value in use is greater than the net selling price, it should have been used to calculate the impairment loss.

[365] An investment in trading securities is measured on the statement of financial position at the

A. Cost to acquire the asset.
B. Accumulated income minus accumulated dividends since acquisition.
C. Lower of cost or market.
D. Fair value.

- Answer (A) is incorrect because Cost is adjusted for changes in fair value.
- Answer (B) is incorrect because An equity-based investment is adjusted for the investor’s share of the investee’s earnings, minus dividends received.
- Answer (C) is incorrect because Lower of cost or market is applied by U.S. GAAP to inventories, not trading securities.
- Answer (D) is correct. Under U.S. GAAP, trading securities are those held principally for sale in the near term. They are classified as current and consist of debt securities and equity securities with readily determinable fair values. Unrealized holding gains and losses on trading securities are reported in earnings. Hence, these securities are reported at fair value.

[366] An investment in available-for-sale securities is measured on the statement of financial position at the

A. Cost to acquire the asset.
B. Accumulated income less accumulated dividends since acquisition.
C. Fair value.
D. Par or stated value of the securities.

- Answer (A) is incorrect because Cost is adjusted for changes in fair value.
- Answer (B) is incorrect because An equity-based investment is adjusted for the investor’s share of the investee’s earnings, minus dividends received.
- Answer (C) is correct. Under U.S. GAAP, available-for-sale securities are investments in debt securities that are not classified as held-to-maturity or trading securities and in equity securities with readily determinable fair values that are not classified as trading securities. They are measured at fair value in the balance sheet.
- Answer (D) is incorrect because The par or stated value is an arbitrary amount.
When using fair value accounting, it would be to a firm’s benefit to report the liability at fair value when it has

A. $32 million in outstanding bonds trading at 101.
B. $50 million in variable-rate preferred shares outstanding.
C. $28 million in outstanding bonds trading at 98.
D. $25 million in put-able bonds trading at 102.

- Answer (A) is incorrect because the fair value of $32,320,000 ($32,000,000 × 1.01) is greater than the carrying amount of $32,000,000. The company would not want to report the liability at fair value in this case because it will increase the liabilities on the balance sheet.
- Answer (B) is incorrect because variable-rate preferred stock is preferred stock paying a dividend that varies from time to time. Usually, the dividend rate is the same as the interest rate on a treasury security. A company would not want to record this at fair value due to the volatility in price changes that could occur.
- Answer (C) is correct. A firm would want to report a liability at fair value when its fair value is less than its carrying amount. The fair value of this bond ($27,440,000 = $28,000,000 × .98) is less than its carrying amount of $28,000,000. This would decrease the liabilities section of the balance sheet, which a company would prefer to do.
- Answer (D) is incorrect because the fair value of $25,500,000 ($25,000,000 × 1.02) is greater than the carrying amount of $25,000,000. The company would not want to report the liability at fair value in this case because it will increase the liabilities on the balance sheet.

The type of risk that is not diversifiable and affects the value of a portfolio is

A. Purchasing-power risk.
B. Market risk.
C. Nonmarket risk.
D. Interest-rate risk.

- Answer (A) is incorrect because purchasing-power risk is the risk that a general rise in the price level will reduce the quantity of goods that can be purchased with a fixed sum of money.
- Answer (B) is correct. Prices of all stocks, even the value of portfolios, are correlated to some degree with broad swings in the stock market. Market risk is the risk that changes in a stock’s price will result from changes in the stock market as a whole. Market risk is commonly referred to as nondiversifiable risk.
- Answer (C) is incorrect because nonmarket risk is the risk that is influenced by an individual firm’s policies and decisions. Nonmarket risk is diversifiable since it is specific to each firm.
- Answer (D) is incorrect because interest-rate risk is the risk that the value of an asset will fluctuate due to changes in the interest rate.

When purchasing temporary investments, which one of the following best describes the risk associated with the ability to sell the investment in a short period of time without significant price concessions?

A. Interest-rate risk.
B. Purchasing-power risk.
C. Financial risk.
D. Liquidity risk.

- Answer (A) is incorrect because interest-rate risk is caused by fluctuations in the value of an asset as interest rates change. Its components are price risk and reinvestment-rate risk.
Answer (B) is incorrect because Purchasing-power risk is the risk that a general rise in the price level (inflation) will reduce what can be purchased with a fixed sum of money.

Answer (C) is incorrect because Financial risk is the risk borne by shareholders, in excess of basic business risk that arises from use of financial leverage (issuance of fixed income securities, i.e., debt and preferred stock).

Answer (D) is correct. Liquidity risk is the possibility that an asset cannot be sold on short notice for its market value. If an asset must be sold at a high discount, it is said to have a substantial amount of liquidity risk.

The risk that securities cannot be sold at a reasonable price on short notice is called

A. Default risk.
B. Interest-rate risk.
C. Purchasing-power risk.
D. Liquidity risk.

Answer (A) is incorrect because Default risk is the risk that a borrower will not pay the interest or principal on a loan.

Answer (B) is incorrect because Interest-rate risk is the risk to which investors are exposed because of changing interest rates.

Answer (C) is incorrect because Purchasing-power risk is the risk that inflation will reduce the purchasing power of a given sum of money.

Answer (D) is correct. An asset is liquid if it can be converted to cash on short notice. Liquidity (marketability) risk is the risk that assets cannot be sold at a reasonable price on short notice. If an asset is not liquid, investors will require a higher return than for a liquid asset. The difference is the liquidity premium.

Political risk may be reduced by

A. Entering into a joint venture with another foreign company.
B. Making foreign operations dependent on the domestic parent for technology, markets, and supplies.
C. Refusing to pay higher wages and higher taxes.
D. Financing with capital from a foreign country.

Answer (A) is incorrect because Political risk may be reduced by entering into a joint venture with a company from the host country rather than from a foreign country.

Answer (B) is correct. Political risk is the risk that a foreign government may act in a way that will reduce the value of the company’s investment. Political risk may be reduced by making foreign operations dependent on the domestic parent for technology, markets, and supplies.

Answer (C) is incorrect because Refusing to pay higher wages and higher taxes will only increase political risk.

Answer (D) is incorrect because Political risk may be reduced by financing with local capital, rather than foreign capital.

The risk of loss because of fluctuations in the relative value of foreign currencies is called

A. Expropriation risk.
B. Multinational beta.
C. Exchange rate risk.
D. Undiversifiable risk.
Answer (A) is incorrect because Expropriation risk is the risk that the sovereign country in which the assets backing an investment are located will seize the assets without adequate compensation.

Answer (B) is incorrect because The beta value in the capital asset pricing model for a multinational firm is the systematic risk of a given multinational firm relative to that of the market as a whole.

Answer (C) is correct. When amounts to be paid or received are denominated in a foreign currency, exchange rate fluctuations may result in exchange gains or losses. For example, if a U.S. firm has a receivable fixed in terms of units of a foreign currency, a decline in the value of that currency relative to the U.S. dollar results in a foreign exchange loss.

Answer (D) is incorrect because The beta value in the capital asset pricing model for a multinational firm is the systematic risk of a given multinational firm relative to that of the market as a whole. It is an undiversifiable risk.

Prior to the introduction of the euro, O & B Company, a U.S. corporation, was in possession of accounts receivable denominated in Deutsche marks. To what type of risk were they exposed?

A. Liquidity risk.
B. Business risk.
C. Exchange-rate risk.
D. Price risk.

Answer (A) is incorrect because Liquidity risk is the possibility that an asset cannot be sold on short notice for its market value.

Answer (B) is incorrect because Business risk is the risk of fluctuations in earnings before interest and taxes or in operating income when the firm uses no debt.

Answer (C) is correct. Exchange-rate risk is the risk that a foreign currency transaction will be negatively exposed to fluctuations in exchange rates. Because O & B Company sells goods to German customers and records accounts receivable denominated in Deutsche marks, O & B Company is exposed to exchange-rate risk.

Answer (D) is incorrect because Price risk is a component of interest-rate risk.

An investment security with high risk will have a(n)

A. Low expected return.
B. Lower price than an asset with low risk.
C. Increasing expected rate of return.
D. High standard deviation of returns.

Answer (A) is incorrect because An investment security with high risk will have a high expected return to compensate for the additional risk.

Answer (B) is incorrect because An investment security with high risk will not necessarily have a lower price than an investment security with low risk. For example, two bond issues with different risk levels might be sold at the same price but have different interest rates.

Answer (C) is incorrect because An expected rate of return by definition is a constant expected return.

Answer (D) is correct. The greater the standard deviation of the expected return, the riskier the investment. A large standard deviation implies that the range of possible returns is wide; i.e., the probability distribution is broadly dispersed. Conversely, the smaller the standard deviation, the tighter the probability distribution and the lower the risk.
Catherine & Co. has extra cash at the end of the year and is analyzing the best way to invest the funds. The company should invest in a project only if the

A. Expected return on the project exceeds the return on investments of comparable risk.
B. Return on investments of comparable risk exceeds the expected return on the project.
C. Expected return on the project is equal to the return on investments of comparable risk.
D. Return on investments of comparable risk equals the expected return on the project.

- Answer (A) is correct. Investment risk is analyzed in terms of the probability that the actual return on an investment will be lower than the expected return. Comparing a project’s expected return with the return on an asset of similar risk helps determine whether the project is worth investing in. If the expected return on a project exceeds the return on an asset of comparable risk, the project should be pursued.
- Answer (B) is incorrect because a project should be pursued only if its expected return exceeds the return on investments of similar risk.
- Answer (C) is incorrect because a project should be pursued only if its expected return exceeds the return on investments of similar risk.
- Answer (D) is incorrect because a project should be pursued only if its expected return exceeds the return on investments of similar risk.

The marketable securities with the least amount of default risk are

A. Federal government agency securities.
B. U.S. Treasury securities.
C. Repurchase agreements.
D. Commercial paper.

- Answer (A) is incorrect because securities issued by a federal agency are first backed by that agency and secondarily by the U.S. government. Agency securities are issued by agencies and corporations created by the federal government, such as the Federal Housing Administration.
- Answer (B) is correct. The marketable securities with the lowest default risk are those issued by the federal government because they are backed by the full faith and credit of the U.S. government and are therefore the least risky form of investment.
- Answer (C) is incorrect because repurchase agreements could become worthless if the organization agreeing to make the repurchase goes bankrupt.
- Answer (D) is incorrect because commercial paper is unsecured.

The best example of a marketable security with minimal risk would be

A. Municipal bonds.
B. The common stock of a AAA-rated company.
C. The commercial paper of a AAA-rated company.
D. Stock options of a AAA-rated company.

- Answer (A) is incorrect because municipal bonds are rarely considered marketable securities in that they constitute long-term debt.
- Answer (B) is incorrect because common stock does not have as high a priority in company assets as commercial paper or other debt.
Answer (C) is correct. Of the choices given, the commercial paper of a top-rated (most creditworthy) company has the least risk. Commercial paper is preferable to stock or stock options because the latter represent only a residual equity in a corporation. Commercial paper is debt and thus has priority over stockholders’ claims. Also, commercial paper is a very short-term investment. The maximum maturity allowed without SEC registration is 270 days. However, it can be sold only to sophisticated investors without registration.

Answer (D) is incorrect because Common stock does not have as high a priority in company assets as commercial paper or other debt.

Which of the following classes of securities are listed in order from lowest risk/opportunity for return to highest risk/opportunity for return?

A. U.S. Treasury bonds; corporate first mortgage bonds; corporate income bonds; preferred stock.
B. Corporate income bonds; corporate mortgage bonds; convertible preferred stock; subordinated debentures.
C. Common stock; corporate first mortgage bonds; corporate second mortgage bonds; corporate income bonds.
D. Preferred stock; common stock; corporate mortgage bonds; corporate debentures.

Answer (A) is correct. The general principle is that risk and return are directly correlated. U.S. Treasury securities are backed by the full faith and credit of the federal government and are therefore the least risky form of investment. However, their return is correspondingly lower. Corporate first mortgage bonds are less risky than income bonds or stock because they are secured by specific property. In the event of default, the bondholders can have the property sold to satisfy their claims. Holders of first mortgages have rights paramount to those of any other parties, such as holders of second mortgages. Income bonds pay interest only in the event the corporation earns income. Thus, holders of income bonds have less risk than shareholders because meeting the condition makes payment of interest mandatory. Preferred shareholders receive dividends only if they are declared, and the directors usually have complete discretion in this matter. Also, shareholders have claims junior to those of debtholders if the enterprise is liquidated.

Answer (B) is incorrect because The proper listing is mortgage bonds, subordinated debentures, income bonds, and preferred stock. Debentures are unsecured debt instruments. Their holders have enforceable claims against the issuer even if no income is earned or dividends declared.

Answer (C) is incorrect because The proper listing is first mortgage bonds, second mortgage bonds, income bonds, and common stock. The second mortgage bonds are secured, albeit junior, claims.

Answer (D) is incorrect because The proper listing is mortgage bonds, debentures, preferred stock, and common stock. Holders of common stock cannot receive dividends unless the holders of preferred stock receive the stipulated periodic percentage return, in addition to any averages if the preferred stock is cumulative.

From the viewpoint of the investor, which of the following securities provides the least risk?

A. Mortgage bond.
B. Subordinated debenture.
C. Income bond.
D. Debentures.

Answer (A) is correct. A mortgage bond is secured with specific fixed assets, usually real property. Thus, under the rights enumerated in the bond indenture, creditors will be able to receive payments from liquidation of the property in case of default. In a bankruptcy proceeding, these amounts are paid before any transfers are made to other creditors, including those preferences. Hence, mortgage bonds are less risky than the others listed.

Answer (B) is incorrect because A debenture is long-term debt that is not secured (collateralized) by specific property. Subordinated debentures have a claim on the debtor’s assets that may be satisfied only after senior debt has been paid in full. Debentures of either kind are therefore more risky than mortgage bonds.
Answer (C) is incorrect because an income bond pays interest only if the debtor earns it. Such bonds are also more risky than secured debt.

Answer (D) is incorrect because unsecured debt is riskier than a mortgage bond.

An investor is currently holding income bonds, debentures, subordinated debentures, and first-mortgage bonds. Which of these securities traditionally is considered to have the least risk?

A. Income bonds.
B. Debentures.
C. Subordinated debentures.
D. First-mortgage bonds.

- Answer (A) is incorrect because income bonds pay interest only if interest is earned.
- Answer (B) is incorrect because debentures are unsecured bonds.
- Answer (C) is incorrect because subordinated debentures are subordinated to other debt.
- Answer (D) is correct. A mortgage bond is secured with specific fixed assets, usually real property. Thus, under the rights enumerated in the bond indenture, creditors will be able to receive payments from liquidation of the property in case of default. In a bankruptcy proceeding, these amounts are paid before any transfers are made to other creditors, including those preferences. Hence, mortgage bonds are less risky than the others listed.

City Development, Inc., is considering a new investment project that will involve building a large office block in Frankfurt-am-Main. The firm’s financial analysis department has estimated that the proposed investment has the following estimated rate of return distributions.

<table>
<thead>
<tr>
<th>Rate of Return</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5%)</td>
<td>30%</td>
</tr>
<tr>
<td>10%</td>
<td>50%</td>
</tr>
<tr>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Calculate the expected rate of return.

A. 5.5%
B. 7.5%
C. 10.5%
D. 11.7%

- Answer (A) is incorrect because this percentage is a nonsense result.
Answer (B) is correct. The expected rate of return of an investment can be calculated by weighting each potential rate of return by its probability of occurrence and summing the results. City Development’s expected rate of return for this development is thus derived as follows:

<table>
<thead>
<tr>
<th>Rate of Return</th>
<th>Probability</th>
<th>Expected Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5.0)%</td>
<td>30.0%</td>
<td>(1.5)%</td>
</tr>
<tr>
<td>10.0%</td>
<td>50.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>20.0%</td>
<td>20.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Answer (C) is incorrect because this percentage results from improperly treating the negative 5% return as a positive number.

Answer (D) is incorrect because this percentage results from treating the negative return as a positive number and weighting the three possible results equally.

Russell, Inc., is evaluating four independent investment proposals. The expected returns and standard deviations for each of these proposals are presented below.

<table>
<thead>
<tr>
<th>Investment Proposal</th>
<th>Expected Returns</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>16%</td>
<td>10%</td>
</tr>
<tr>
<td>II</td>
<td>14%</td>
<td>10%</td>
</tr>
<tr>
<td>III</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td>IV</td>
<td>22%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Which one of the investment proposals has the least relative level of risk?

A. Investment I.
B. Investment II.
C. Investment III.
D. Investment IV.

Answer (A) is incorrect because the coefficient of variation for Investment I is 0.625 (10% ÷ 16%), which is not the lowest coefficient of the four.

Answer (B) is incorrect because Investment II has the highest relative level of risk with a coefficient of variation of 0.714 (10% ÷ 14%).

Answer (C) is correct. The coefficient of variation is useful when the rates of return and standard deviations of investments differ. It measures the risk per unit of return because it divides the standard deviation (σ) by the expected rate of return (R). The coefficients of variation of Russell’s four investment proposals can thus be calculated as follows:

<table>
<thead>
<tr>
<th>Investment</th>
<th>Expected Returns</th>
<th>Standard Deviation</th>
<th>Coefficient of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>16%</td>
<td>10%</td>
<td>0.625</td>
</tr>
<tr>
<td>II</td>
<td>14%</td>
<td>10%</td>
<td>0.714</td>
</tr>
<tr>
<td>III</td>
<td>20%</td>
<td>11%</td>
<td>0.550</td>
</tr>
<tr>
<td>IV</td>
<td>22%</td>
<td>15%</td>
<td>0.682</td>
</tr>
</tbody>
</table>
Answer (D) is incorrect because the coefficient of variation for Investment IV is 0.682 (15% ÷ 22%), which is not the lowest coefficient of the four.

The expected rate of return for the stock of Cornhusker Enterprises is 20%, with a standard deviation of 15%. The expected rate of return for the stock of Mustang Associates is 10%, with a standard deviation of 9%. The riskier stock is

A. Cornhusker because the return is higher.
B. Cornhusker because the standard deviation is higher.
C. Mustang because the standard deviation is higher.
D. Mustang because the coefficient of variation is higher.

- Answer (A) is incorrect because the existence of a higher return is not necessarily indicative of high risk.
- Answer (B) is incorrect because the higher standard deviation must be viewed relative to the mean of the population; the absolute level of the standard deviation is meaningless without a knowledge of the mean.
- Answer (C) is incorrect because Mustang does not have the higher standard deviation.
- Answer (D) is correct. The coefficient of variation is useful when the rates of return and standard deviations of two investments differ. It measures the risk per unit of return because it divides the standard deviation by the expected return. The coefficient of variation is much higher for Mustang (.09 ÷ .10 = .9) than for Cornhusker (.15 ÷ .20 = .75).

A feasible portfolio that offers the highest expected return for a given risk or the least risk for a given expected return is a(n)

A. Optimal portfolio.
B. Desirable portfolio.
C. Efficient portfolio.
D. Effective portfolio.

- Answer (A) is incorrect because an optimal portfolio is a portfolio selected from the efficient set of portfolios because it is tangent to the investor’s highest indifference curve.
- Answer (B) is incorrect because a desirable portfolio is a nonsense term.
- Answer (C) is correct. A feasible portfolio that offers the highest expected return for a given risk or the least risk for a given expected return is called an efficient portfolio.
- Answer (D) is incorrect because an effective portfolio is a nonsense term.

The state of the economy has a strong effect on the expected returns for Techspace, Inc., as shown below:

<table>
<thead>
<tr>
<th>State of the Economy</th>
<th>Probability</th>
<th>Techspace Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recession</td>
<td>.35</td>
<td>-10%</td>
</tr>
<tr>
<td>Stable</td>
<td>.40</td>
<td>10%</td>
</tr>
<tr>
<td>Expansion</td>
<td>.25</td>
<td>30%</td>
</tr>
</tbody>
</table>
What is the expected rate of return on Techspace, Inc., stock?

A. 8%  
B. 10%  
C. 15%  
D. 30%  

Answer (A) is correct. The expected rate of return on an investment is the sum of the weighted averages of the possible outcomes weighted by their probabilities. For Techspace, the computation is performed as follows:

<table>
<thead>
<tr>
<th>State of the Economy</th>
<th>Rate of Return</th>
<th>Probability</th>
<th>Weighted Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recession</td>
<td>(10)%</td>
<td>35%</td>
<td>(3.5)%</td>
</tr>
<tr>
<td>Stable</td>
<td>10%</td>
<td>40%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Expansion</td>
<td>30%</td>
<td>25%</td>
<td>7.5%</td>
</tr>
<tr>
<td><strong>Expected rate of return</strong></td>
<td></td>
<td></td>
<td><strong>8.0%</strong></td>
</tr>
</tbody>
</table>

Answer (B) is incorrect because this percentage is a simple average of the returns.  
Answer (C) is incorrect because this percentage results from adding, rather than subtracting, the average for the recession state.  
Answer (D) is incorrect because this percentage results from failing to weight the rates of return by their probabilities.

Given an expected rate of return on Techspace, Inc., stock of 8.0%, the standard deviation (σ) is

A. 2.36%  
B. 8.12%  
C. 8.0%  
D. 15.36%

Answer (A) is incorrect because the standard deviation (σ) is the square root of this percentage.  
Answer (B) is incorrect because this percentage results from failing to weight the squared variances.  
Answer (C) is incorrect because the expected rate of return is 8.0%.
Answer (D) is correct. Techspace’s total weighted squared variances can be calculated in two steps. First, the individual variances are computed:

<table>
<thead>
<tr>
<th>State of the Economy</th>
<th>Rate of Return</th>
<th>Expected Rate</th>
<th>Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recession</td>
<td>(10)%</td>
<td>8%</td>
<td>(18)%</td>
</tr>
<tr>
<td>Stable</td>
<td>10%</td>
<td>8%</td>
<td>2%</td>
</tr>
<tr>
<td>Expansion</td>
<td>30%</td>
<td>8%</td>
<td>22%</td>
</tr>
</tbody>
</table>

The total weighted squared variances is arrived at by squaring, weighting, and summing the individual variances:

<table>
<thead>
<tr>
<th>State of the Economy</th>
<th>Variances</th>
<th>Squared</th>
<th>Probability</th>
<th>Weighted Squared Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recession</td>
<td>(18)%</td>
<td>3.24%</td>
<td>35%</td>
<td>1.134%</td>
</tr>
<tr>
<td>Stable</td>
<td>2%</td>
<td>0.04%</td>
<td>40%</td>
<td>0.016%</td>
</tr>
<tr>
<td>Expansion</td>
<td>22%</td>
<td>4.84%</td>
<td>25%</td>
<td>1.210%</td>
</tr>
</tbody>
</table>

Total weighted squared variances = 2.360%

The standard deviation (σ) of Techspace returns is the square root of this number \( \sqrt{2.360%} = 15.36% \).

[387] (Refers to Fact Pattern #59)

Given that the standard deviation (σ) of Techspace returns is 15.36% and the expected rate of return is 8%, the coefficient of variation is

A. 1.0
B. 1.23
C. 1.92
D. 2.36

- Answer (A) is incorrect because One is the upper limit of the value for the beta coefficient of a security.
- Answer (B) is incorrect because This percentage results from multiplying, rather than dividing, the standard deviation and expected rate of return.
- Answer (C) is correct. The coefficient of variation is useful when the rates of return and standard deviations of two investments differ. It measures the risk per unit of return.

\[
\text{Coefficient of variation} = \frac{\text{Standard deviation (σ)}}{\text{Expected rate of return}}
\]

Techspace’s is calculated as follows:

\[
\text{Coefficient of variation} = \frac{15.36\%}{8\%} = 1.92
\]

- Answer (D) is incorrect because This percentage is the total weighted squared variance.
If the covariance of Stock A with Stock B is –.0076, then what is the covariance of Stock B with Stock A?

A. +.0076  
B. –.0076  
C. Greater than .0076.  
D. Less than –.0076.

- Answer (A) is incorrect because the covariance of Stock B with Stock A is the same as the covariance of Stock A with Stock B.
- Answer (B) is correct. The covariance measures the volatility of returns together with their correlation with the returns of other securities. It equals the coefficient of correlation of the securities being compared times the standard deviations of the securities. The covariance of two stocks is the same regardless of which stock is compared to the other.
- Answer (C) is incorrect because the covariance of Stock B with Stock A is the same as the covariance of Stock A with Stock B.
- Answer (D) is incorrect because the covariance of Stock B with Stock A is the same as the covariance of Stock A with Stock B.

Standard deviation and expected return information for four investments selling for the same price is as follows:

<table>
<thead>
<tr>
<th>Investment</th>
<th>Standard Deviation</th>
<th>Expected Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>B</td>
<td>20%</td>
<td>18%</td>
</tr>
<tr>
<td>C</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>D</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

What investment is the best choice in terms of the risk/return relationship?

A. Investment A.  
B. Investment B.  
C. Investment C.  
D. Investment D.

- Answer (A) is incorrect because Investment A has a risk per unit of return of 1.25 (.25 ÷ .20), which is higher than that of Investment D.
- Answer (B) is incorrect because Investment B has a risk per unit of return of 1.11 (.20 ÷ .18), which is higher than that of Investment D.
- Answer (C) is incorrect because Investment C has a risk per unit of return of 1.50 (.12 ÷ .08), which is higher than that of Investment D.
- Answer (D) is correct. The coefficient of variation is useful when the rates of return and standard deviations of two investments differ. It measures the risk per unit of return because it divides the standard deviation by the expected return. Thus, the risk per unit of return for Investment D is 1.00 (.10 ÷ .10), which is the lowest of the given investments.
[Fact Pattern #60]
The following information is known about three common stocks:

<table>
<thead>
<tr>
<th></th>
<th>Stock A</th>
<th>Stock B</th>
<th>Stock C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected rate of return</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>Weighted squared variances of returns</td>
<td>6</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

Using only the standard deviation of projected returns, which stock is riskiest?

A. Stock A.
B. Stock B.
C. Stock C.
D. Cannot be determined from information given.

- Answer (A) is correct. The risk of a stock can be measured using the standard deviation of its projected returns. This standard deviation is the square root of the sum of all the probability-weighted squared variances of the projected returns. Thus, the standard deviations of the three stocks presented are, respectively, 2.45, 2.24, and 2.00. The highest of these, indicating the riskiest stock, is 2.45, Stock A.
- Answer (B) is incorrect because Stock B’s standard deviation is lower than that of Stock A.
- Answer (C) is incorrect because Stock C’s standard deviation is lower than that of Stock A.
- Answer (D) is incorrect because Stock A has the highest standard deviation.

[391] (Refers to Fact Pattern #60)
The coefficient of variation is useful when the rates of return and standard deviations of investments differ because it measures risk per unit of return. Which stock is riskiest based on a coefficient of variation analysis?

A. Stock A.
B. Stock B.
C. Stock C.
D. Stocks A and C have equal risk when analyzed on a per-unit of return basis.

- Answer (A) is incorrect because The coefficient of variation for Stock A is 2.45, which is higher than that for Stock C.
- Answer (B) is incorrect because The coefficient of variation for Stock B is 2.24, which is higher than that for Stock C.
- Answer (C) is correct. The coefficient of variation of an investment is calculated by dividing the standard deviation by the expected rate of return. This standard deviation is the square root of the sum of all the probability-weighted squared variances of the projected returns. Thus, the standard deviations of the three stocks presented are, respectively, 2.45, 2.24, and 2.00. Dividing each by the expected rate of return gives the coefficient of variation (Stock A: 2.45 ÷ 3% = 81.7; Stock B: 2.24 ÷ 4% = 56.0; Stock C: 2.00 ÷ 2% = 100). Stock C is therefore the riskiest on a per-unit of return basis.
- Answer (D) is incorrect because The variation for Stock A is 2.45, which is higher than that for Stock C.
The risk of a single stock is

A. Interest rate risk.
B. Security risk.
C. Portfolio risk.
D. Market risk.

- Answer (A) is incorrect because Interest rate risk is the risk of changes in interest rates.
- Answer (B) is correct. Security risk is the risk of a single stock, whereas portfolio risk is its risk if it is held in a large portfolio of diversified securities. Portfolio risk therefore includes diversifiable and undiversifiable risk.
- Answer (C) is incorrect because Portfolio risk is the net risk of multiple securities.
- Answer (D) is incorrect because Market risk is undiversifiable risk.

A U.S. company currently has domestic operations only. It is considering an equal-size investment in either Canada or Britain. The data on expected rate of return and the risk associated with each of these proposed investments are given below.

<table>
<thead>
<tr>
<th>Proposed Investment</th>
<th>Expected Rate of Return</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Investment</td>
<td>22%</td>
<td>10%</td>
</tr>
<tr>
<td>Canadian Investment</td>
<td>28%</td>
<td>15%</td>
</tr>
</tbody>
</table>

The expected rate of return on the company’s current, domestic only, business is 20% with a standard deviation of 15%. Using the above data and the correlation coefficients, the company calculated the following portfolio risk and return (based on a ratio of 50% U.S. domestic operations and 50% international operations).

<table>
<thead>
<tr>
<th>Proposed Investment</th>
<th>Expected Rate of Return</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. and Britain</td>
<td>21%</td>
<td>3%</td>
</tr>
<tr>
<td>U.S. and Canada</td>
<td>24%</td>
<td>15%</td>
</tr>
</tbody>
</table>

The company plans to select the optimal combination of countries based on risk and return for the domestic and international investments taken together. Because the company is new to the international business environment, it is relatively risk averse. Based on the above data, which one of the following alternatives provides the best risk-adjusted return to the firm?

A. Undertake the British investment.
B. Undertake the Canadian investment.
C. Do not undertake either investment.
D. Unable to determine based on data given.

- Answer (A) is correct. A risk-averse company will select the investment with the lesser risk. Thus, by choosing to invest in Britain, the overall rate of return will increase from 20% to 21%, and risk, based on the standard deviation, will decline from 15% to 3%. This gives a better return per unit of risk as compared to the Canadian investment.
- Answer (B) is incorrect because The Canadian investment would increase the return to 24% but would not change the degree of risk.
- Answer (C) is incorrect because To invest in Britain is more desirable than the status quo in terms of both return (21% versus 20%) and risk (3% versus 15%).
Answer (D) is incorrect because The standard deviations and expected rates of return are adequate information upon which to base a decision.

[394] An optimal portfolio of investments is

A. Efficient because it offers the highest expected return.
B. Any portfolio chosen from the efficient set of portfolios.
C. Any portfolio chosen from the feasible set of portfolios.
D. Tangent to the investor’s highest indifference curve.

- Answer (A) is incorrect because A portfolio is efficient if it offers the highest return for a given risk or the least risk for a given return.
- Answer (B) is incorrect because The optimal portfolio is tangent to the investor’s highest indifference curve. Thus, it is the efficient portfolio with the highest utility.
- Answer (C) is incorrect because The optimal portfolio is efficient as well as feasible.
- Answer (D) is correct. An investor wants to maximize expected return and minimize risk when choosing a portfolio. A feasible portfolio that offers the highest expected return for a given risk or the least risk for a given expected return is an efficient portfolio. A portfolio that is selected from the efficient set of portfolios because it is tangent to the investor’s highest indifference curve is the optimal portfolio.

[395] If two projects are completely and positively linearly dependent (or positively related), the measure of correlation between them is

A. 0
B. +.5
C. +1
D. −1

- Answer (A) is incorrect because A zero correlation indicates no relationship.
- Answer (B) is incorrect because This figure does not indicate linearity.
- Answer (C) is correct. The measure of correlation when two projects are linearly dependent in a positive way will be +1.0.
- Answer (D) is incorrect because A positive relationship is indicated by a positive sign.

[396] The returns on two stocks can be correlated in values except those that are

A. Positive.
B. Negative.
C. Neutral.
D. Skewed.

- Answer (A) is incorrect because Returns on two stocks can be correlated in any value that falls within the range of −1.0 to 1.0.
- Answer (B) is incorrect because Returns on two stocks can be correlated in any value that falls within the range of −1.0 to 1.0.
Answer (C) is incorrect because Returns on two stocks can be correlated in any value that falls within the range of –1.0 to 1.0.

Answer (D) is correct. The correlation coefficient ($r$) measures the degree to which any two variables are related. It ranges from –1.0 to 1.0. Perfect positive correlation (1.0) means that the two variables always move together. Perfect negative correlation (–1.0) means that the two variables always move inversely to one another. A neutral correlation, or no correlation, is 0.0. Skewed is a nonsense concept in this context.

[397] Which of the following specifically measures the volatility of returns together with their correlation with the returns of other securities?

A. Variance.
B. Standard deviation.
C. Coefficient of variation.
D. Covariance.

Answer (A) is incorrect because The variance is calculated for a single investment.
Answer (B) is incorrect because The standard deviation is calculated for a single investment. The standard deviation gives an exact value for the tightness of the distribution and the riskiness of the investment. The standard deviation ($\sigma$) is the square root of the variance.
Answer (C) is incorrect because The coefficient of variation is calculated for a single investment. The coefficient of variation is useful when the rates of return and standard deviations of two investments differ. It measures the risk per unit of return because it divides the standard deviation by the expected return.
Answer (D) is correct. An important measurement used in portfolio analysis is the covariance. It measures the volatility of returns together with their correlation with the returns of other securities. For two stocks X and Y, the covariance is calculated using the following formula:

$$\text{Coefficient of correlation} \times \text{Standard deviation}_X$$

[398] A market analyst has estimated the equity beta of Modern Homes, Inc., to be 1.4. This beta implies that the company’s

A. Systematic risk is lower than that of the market portfolio.
B. Systematic risk is higher than that of the market portfolio.
C. Unsystematic risk is higher than that of the market portfolio.
D. Total risk is higher than that of the market portfolio.

Answer (A) is incorrect because A beta of less than 1.0 means that the market, or systematic, risk is lower than that of the market portfolio.
Answer (B) is correct. Systematic risk, also called market risk and undiversifiable risk, is the risk of the stock market as a whole. Some conditions in the national economy affect all businesses, which is why equity prices so often move together. The effect of an individual security on the volatility of a portfolio is measured by its sensitivity to movements by the overall market. This sensitivity is stated in terms of a stock’s beta coefficient. An average-risk stock has a beta of 1.0 because its returns are perfectly positively correlated with those on the market portfolio.
Answer (C) is incorrect because Unsystematic risk is the risk that is influenced by an individual firm’s policies and decisions. The beta does not concern unsystematic risk.
Answer (D) is incorrect because Only a portion of the risk, not the total risk, is higher than that of the market portfolio.
A measure that describes the risk of an investment project relative to other investments in general is the  

A. Coefficient of variation.  
B. Beta coefficient.  
C. Standard deviation.  
D. Expected return.  

- Answer (A) is incorrect because the coefficient of variation compares risk with expected return (standard deviation ÷ expected return).  
- Answer (B) is correct. The required rate of return on equity capital in the capital asset pricing model is the risk-free rate (determined by government securities), plus the product of the market risk premium times the beta coefficient (beta measures the firm’s risk). The market risk premium is the amount above the risk-free rate that will induce investment in the market. The beta coefficient of an individual stock is the correlation between the volatility (price variation) of the stock market and that of the price of the individual stock. For example, if an individual stock goes up 15% and the market only 10%, beta is 1.5.  
- Answer (C) is incorrect because standard deviation measures dispersion (risk) of project returns.  
- Answer (D) is incorrect because expected return does not describe risk.  

The benefits of diversification decline to near zero when the number of securities held increases beyond  

A. 4  
B. 6  
C. 10  
D. 40  

- Answer (A) is incorrect because the benefits of diversification do not diminish until about 20 to 30 different securities are held.  
- Answer (B) is incorrect because the benefits of diversification do not diminish until about 20 to 30 different securities are held.  
- Answer (C) is incorrect because the benefits of diversification do not diminish until about 20 to 30 different securities are held.  
- Answer (D) is correct. The benefits of diversification become extremely small when more than 20 to 30 different securities are held. Moreover, commissions and other transaction costs increase with greater diversification.  

What is the formula for the beta coefficient of a security?  

A. Covariance of the returns on the market and on the security ÷ Variance of the return on the market.  
B. Covariance of the returns on the market and on the security × Variance of the return on the market.  
C. Variance of the return on the market ÷ Variance of the return on the security.  
D. Variance of the return on the market × Variance of the return on the security ÷ Covariance of the returns on the market and on the security.  

- Answer (A) is correct. The word beta is derived from the regression equation for regressing the return of an individual security (the dependent variable) to the overall market return. The beta coefficient is the slope of the regression line. The beta for a security may also be calculated by dividing the covariance of the return on the market and the return on the security by the variance of the return on the market.  
- Answer (B) is incorrect because beta equals the covariance of the returns on the market and on the security divided by the variance of the return on the market.
Answer (C) is incorrect because Beta equals the covariance of the returns on the market and on the security divided by the variance of the return on the market.

Answer (D) is incorrect because Beta equals the covariance of the returns on the market and on the security divided by the variance of the return on the market.

[402] Based on the following information about stock price increases and decreases, make an estimate of the stock’s beta: July = Stock +1.5%, Market +1.1%; August = Stock +2.0%, Market +1.4%; September = Stock –2.5%, Market –2.0%.

A. Beta is greater than 1.0.
B. Beta is less than 1.0.
C. Beta equals 1.0.
D. There is no consistent pattern of returns.

- Answer (A) is correct. Beta measures the volatility of the return of a security relative to the returns on the market portfolio. In each case, the stock price increase or decrease was a greater percentage than the market change. Thus, the beta (stock change over market change) is greater than 1.0.
- Answer (B) is incorrect because The beta is greater than one when the stock price changes at a greater rate than the market change.
- Answer (C) is incorrect because The stock change is not the same as the market change.
- Answer (D) is incorrect because There is a consistent pattern of the stock change being greater than the market change.

[403] A company holds the following stock portfolio:

<table>
<thead>
<tr>
<th>Stock</th>
<th>Portfolio % of Total</th>
<th>Beta Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>20%</td>
<td>.8</td>
</tr>
<tr>
<td>X</td>
<td>40%</td>
<td>.6</td>
</tr>
<tr>
<td>Y</td>
<td>30%</td>
<td>1.0</td>
</tr>
<tr>
<td>Z</td>
<td>10%</td>
<td>2.0</td>
</tr>
</tbody>
</table>

The beta of the portfolio is

A. 2.0
B. 1.1
C. .9
D. .8

- Answer (A) is incorrect because The figure 2.0 is the highest beta.
- Answer (B) is incorrect because The figure 1.1 is a simple average of the betas.
- Answer (C) is correct. Beta is the best measure of the risk of an individual security held in a diversified portfolio because it determines how the security affects the risk of the portfolio. The beta of a portfolio is the weighted average of the betas of the individual securities. For example, adding high-beta securities to a portfolio tends to increase its risk. Hence, the beta of the portfolio is .9 \[ (.8 \times .2) + (.6 \times .4) + (1.0 \times .3) + (2.0 \times .1) \].
- Answer (D) is incorrect because The figure .8 is the lowest beta.
[Fact Pattern #61]
DQZ Telecom is considering a project for the coming year that will cost $50 million. DQZ plans to use the following combination of debt and equity to finance the investment.

- Issue $15 million of 20-year bonds at a price of $101, with a coupon rate of 8%, and flotation costs of 2% of par.
- Use $35 million of funds generated from earnings.
- The equity market is expected to earn 12%. U.S. Treasury bonds are currently yielding 5%. The beta coefficient for DQZ is estimated to be .60. DQZ is subject to an effective corporate income tax rate of 40%.

[404] (Refers to Fact Pattern #61)
The capital asset pricing model (CAPM) computes the expected return on a security by adding the risk-free rate of return to the incremental yield of the expected market return, which is adjusted by the company’s beta. Compute DQZ’s expected rate of return.

A. 9.20%
B. 12.20%
C. 7.20%
D. 12.00%

- Answer (A) is correct. The market return ($R_M$), given as 12%, minus the risk-free rate ($R_F$), given as 5%, is the market risk premium. It is the rate at which investors must be compensated to induce them to invest in the market. The beta coefficient ($\beta$) of an individual stock, given as 60%, is the correlation between volatility (price variation) of the stock market and the volatility of the price of the individual stock. Consequently, the expected rate of return is $9.20\% \left[ R_F + \beta \left( R_M - R_F \right) \right] = .05 + .6(.12 - .05)$.
- Answer (B) is incorrect because this percentage equals the risk-free rate plus 60% of the market rate.
- Answer (C) is incorrect because this percentage results from multiplying both the market rate premium and the risk-free rate by 60%.
- Answer (D) is incorrect because this percentage is the market rate.

[405] Using the capital asset pricing model (CAPM), the required rate of return for a firm with a beta of 1.25 when the market return is 14% and the risk-free rate is 6% is

A. 6.0%
B. 7.5%
C. 17.5%
D. 16.0%

- Answer (A) is incorrect because this percentage is the risk-free rate based on insured government securities and bears no relation to the return of the stock market.
- Answer (B) is incorrect because this percentage is calculated by multiplying the beta times the risk-free rate; the beta should be multiplied times the risk premium that is required by investors.
- Answer (C) is incorrect because this percentage is calculated by multiplying the market rate times beta. This ignores the risk premium. The beta should be multiplied times the risk premium that is desired by investors.
Answer (D) is correct. The CAPM adds the risk-free rate to the product of the beta coefficient and the difference between the market return and the risk-free rate. The market-risk premium is the amount above the risk-free rate for which investors must be compensated to induce them to invest in the company. The beta coefficient of an individual stock is the correlation between volatility (price variation) of the stock market and the volatility of the price of the individual stock. Thus, the required rate is 16% \[6\% + 1.25 (14\% – 6\%)\].

An analyst covering Guilderland Mining Co. common stock estimates the following information for next year:

- Expected return on the market portfolio: 12%
- Expected return on Treasury securities: 5%
- Expected beta of Guilderland: 2.2

Using the CAPM, the analyst’s estimate of next year’s risk premium for Guilderland’s stock is closest to

A. 7.0%
B. 10.4%
C. 15.4%
D. 21.4%

Answer (A) is incorrect because this percentage is the difference between the overall market rate of return and the risk-free rate.
Answer (B) is incorrect because this percentage results from improperly subtracting the risk-free rate from the intermediate answer rather than adding.
Answer (C) is correct. The capital asset pricing model derives the risk premium of a particular stock (that is, the excess of the rate of return on the stock over the risk-free rate) by multiplying the stock’s beta by the excess of the market rate of return over the risk-free rate. Mathematically, this is expressed as

\[(R_{\text{Stock}} - R_{\text{Risk-free}}) = \beta \times (R_{\text{Market}} - R_{\text{Risk-free}})\]

For Guilderland Mining, this calculation looks like this:

\[(R_{\text{Stock}} - 5\%) = 2.2 \times (12\% - 5\%)\]
\[(R_{\text{Stock}} - 5\%) = 2.2 \times 7\%
\[(R_{\text{Stock}} - 5\%) = 15.4\%
\[R_{\text{Stock}} = 20.4\%\]

Answer (D) is incorrect because this percentage is based on using the market rate instead of the risk premium when multiplying times beta.

Which of the following is the major difference between the capital asset pricing model (CAPM) and arbitrage pricing theory (APT)?

A. CAPM uses discounted cash flows whereas APT does not.
B. CAPM uses a single systematic risk factor to explain an asset’s return whereas APT uses multiple systematic factors.
C. APT uses a single systematic risk factor to explain an asset’s return whereas CAPM uses multiple systematic factors.
D. Under CAPM, the beta coefficient of the risk-free rate of return is assumed to be higher than that of any asset in the portfolio. Under APT, the beta coefficient of every asset in the portfolio is individually compared to the beta of the risk-free rate.
Answer (A) is incorrect because All calculations of rates of return use discounted cash flows.

Answer (B) is correct. CAPM uses a single systematic risk factor to explain an asset’s return whereas APT uses multiple systematic factors.

Answer (C) is incorrect because CAPM uses a single systematic risk factor to explain an asset’s return whereas APT uses multiple systematic factors.

Answer (D) is incorrect because It is a nonsense answer.

Stock J has a beta of 1.2 and an expected return of 15.6%, and stock K has a beta of 0.8 and an expected return of 12.4%. What is the expected return on the market and the risk-free rate of return, consistent with the capital asset pricing model?

A. Market is 14%; risk-free is 6%.
B. Market is 12.4%; risk-free is 0%.
C. Market is 14%; risk-free is 4%.
D. Market is 14%; risk-free is 1.6%.

Answer (A) is correct. This problem requires the use of simultaneous equations. Set up a CAPM formula for each stock:

Stock J: 15.6 = \( R_F + 1.2( R_M - R_F) \)

Stock K: 12.4 = \( R_F + .8( R_M - R_F) \)

Removing the parentheses and combining terms, you get

Stock J: 15.6 = 1.2R_M - .2R_F

Stock K: 12.4 = .8R_M + .2R_F

Then solve for \( M \). Add the two equations above, \( M = 14 \). Substitute 14 for \( M \) in the second equation:

12.4 = \( R_F + .8(14 - R_F) \)

12.4 = .8R_F + 11.2

1.2 = .2 R_F, or \( R_F = 6 \)

Answer (B) is incorrect because Both rates are wrong.

Answer (C) is incorrect because The risk-free rates are too low.

Answer (D) is incorrect because The risk-free rates are too low.

The difference between the required rate of return on a given risky investment and that on a riskless investment with the same expected utility is the

A. Risk premium.
B. Coefficient of variation.
C. Standard deviation.
D. Beta coefficient.
Answer (A) is correct. The required rate of return on equity capital in the capital asset pricing model is the risk-free rate (determined by government securities) plus the product of the market risk premium times the beta coefficient (beta measures the firm’s risk). The market risk premium is the amount above the risk-free rate that will induce investment in the market. The beta coefficient of an individual stock is the correlation between the volatility (price variation) of the stock market and that of the price of the individual stock.

Answer (B) is incorrect because the coefficient of variation is the standard deviation of an investment’s returns divided by the mean return.

Answer (C) is incorrect because the standard deviation is a measure of the variability of an investment’s returns.

Answer (D) is incorrect because the beta coefficient measures the sensitivity of the investment’s returns to market volatility.

Computechs is an all-equity firm that is analyzing a potential mass communications project which will require an initial after-tax cash outlay of $100,000, and will produce after-tax cash inflows of $12,000 per year for 10 years. In addition, this project will have an after-tax salvage value of $20,000 at the end of Year 10. If the risk-free rate is 5 percent, the return on an average stock is 10 percent, and the $\beta$ of this project is 1.80, then what is the project’s NPV?

A. $(14,544)
B. $4,944
C. $(37,408)
D. $(32,008)

Answer (A) is incorrect because the amount of $(14,544) uses a rate of 9% to discount the net cash inflows of the project.

Answer (B) is incorrect because the amount of $4,944 uses the risk-free rate of 5% to discount the net cash inflows of the project.

Answer (C) is incorrect because the amount of $(37,408) does not consider the NPV of the salvage value of the project at the end of Year 10.

Answer (D) is correct. The cost of capital must be determined in order to calculate NPV.

Using the Capital Asset Pricing Model to determine the cost of capital where $R$ equals the required rate of return on equity capital, $R_e$ equals the risk-free rate, $R_M$ equals the market return, and $\beta$ equals the beta coefficient, then

$$R = R_e + \beta (R_M - R_e)$$
$$R = .05 + 1.8(.10 - .05)$$
$$R = .14$$

The net present value of the project is thus the difference between the initial cost and the sum of the present value of an annuity of $12,000 for 10 years at 14% and the present value of $20,000 in 10 years at 14%. The present value factors are found in the tools section of CMA Test Prep.

$$NPV = [(12,000 \times 5.216) + (20,000 \times .270)] - 100,000$$
$$NPV = 67,992 - 100,000$$
$$NPV = $(32,008)$
[411] The systematic risk of an individual security is measured by the

A. Standard deviation of the security’s rate of return.
B. Covariance between the security’s returns and the general market.
C. Security’s contribution to the portfolio risk.
D. Standard deviation of the security’s returns and other similar securities.

- Answer (A) is incorrect because the standard deviation of a security’s rate of return measures its unsystematic risk.
- Answer (B) is correct. The covariance is a measure of the mutual volatility of two securities. The covariance between the return of a single security and the return on the market as a whole is therefore the systematic (or market) risk of the single security.
- Answer (C) is incorrect because while a security’s risk affects portfolio risk, it is not measured thereby.
- Answer (D) is incorrect because the standard deviation of a security’s rate of return measures its unsystematic risk.

[412] Which one of the following would have the least impact on a firm’s beta value?

A. Debt-to-equity ratio.
B. Industry characteristics.
C. Operating leverage.
D. Payout ratio.

- Answer (A) is incorrect because the debt-to-equity ratio influences volatility of earnings and the beta value.
- Answer (B) is incorrect because industry characteristics determine how a firm’s stock price relates to the value of the market as a whole.
- Answer (C) is incorrect because operating leverage measures the level of fixed costs, and thus the degree of risk, taken on by the firm in its ongoing daily operations; risk has a direct impact on a firm’s profitability with respect to the overall market.
- Answer (D) is correct. The payout ratio is the percentage of income available to common shareholders that was paid out in the form of dividends during a period. The payout ratio is more nearly the result, rather than the cause, of a firm’s beta value. The beta value is based on the volatility of a company’s earnings. Volatility is influenced by both financial and operating leverage and the characteristics of the industry in which the firm operates.

[413] If Dexter Industries has a beta value of 1.0, then its

A. Return should equal the risk-free rate.
B. Price is relatively stable.
C. Expected return should approximate the overall market.
D. Volatility is low.

- Answer (A) is incorrect because the risk-free rate is the rate returned by very safe and nonvolatile securities, such as U.S. government Treasury bills.
- Answer (B) is incorrect because a beta value of 1.0 only means the price of the stock moves in concert with that of the overall market; if the market is not stable, the stock price will not be either.
- Answer (C) is correct. The effect of an individual security on the volatility of a portfolio is measured by its sensitivity to movements by the overall market. This sensitivity is stated in terms of a stock’s beta coefficient. If the beta coefficient is 1.0, then the price of that stock tends to move in the same direction and to the same degree as the overall market.
Answer (D) is incorrect because a beta value of 1.0 only means the price of the stock moves in concert with that of the overall market; if the market is volatile, the stock price will also.

[414] A company is evaluating its experience with five recent investments. The following data are available:

<table>
<thead>
<tr>
<th>Investment</th>
<th>Cost of Investment</th>
<th>Amount Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$8,500</td>
<td>$8,390</td>
</tr>
<tr>
<td>B</td>
<td>4,200</td>
<td>4,610</td>
</tr>
<tr>
<td>C</td>
<td>12,100</td>
<td>12,400</td>
</tr>
<tr>
<td>D</td>
<td>7,900</td>
<td>8,220</td>
</tr>
<tr>
<td>E</td>
<td>11,000</td>
<td>11,400</td>
</tr>
</tbody>
</table>

Rank the investments in order from highest rate of return to lowest.

A. C, E, A, D, B.
B. B, D, E, C, A.
C. B, E, D, C, A.
D. A, C, D, E, B.

- Answer (A) is incorrect because this ranking is in order by amount received, not rate of return.
- Answer (B) is correct. Rate of return is equal to the return on an investment (the amount received minus the amount invested) divided by the amount invested. The calculation for these five investments can be performed as follows:

<table>
<thead>
<tr>
<th>Investment</th>
<th>Cost of Investment</th>
<th>Amount Received</th>
<th>Return</th>
<th>Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$8,500</td>
<td>$8,390</td>
<td>$(110)</td>
<td>(1.3%)</td>
</tr>
<tr>
<td>B</td>
<td>4,200</td>
<td>4,610</td>
<td>410</td>
<td>9.8%</td>
</tr>
<tr>
<td>C</td>
<td>12,100</td>
<td>12,400</td>
<td>300</td>
<td>2.5%</td>
</tr>
<tr>
<td>D</td>
<td>7,900</td>
<td>8,220</td>
<td>320</td>
<td>4.1%</td>
</tr>
<tr>
<td>E</td>
<td>11,000</td>
<td>11,400</td>
<td>400</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because this ranking is in order by return, not rate of return.
- Answer (D) is incorrect because this ranking is from lowest rate of return to highest.

[415] The risk to which all investment securities are subject is known as

A. Credit risk.
B. Diversifiable risk.
C. Unsystematic risk.
D. Systematic risk.

- Answer (A) is incorrect because credit risk is the risk that the issuer of a debt security will default.
- Answer (B) is incorrect because unsystematic risk, also called company or diversifiable risk, is the risk inherent in a particular investment security. Since individual securities are affected differently by economic conditions, this risk can be offset through portfolio diversification.
Answer (C) is incorrect because Unsystematic risk, also called company or diversifiable risk, is the risk inherent in a particular investment security. Since individual securities are affected differently by economic conditions, this risk can be offset through portfolio diversification.

Answer (D) is correct. Systematic risk, also called market risk, is the risk faced by all firms. Changes in the economy as a whole, such as the business cycle, affect all players in the market. For this reason, systematic risk is sometimes referred to as undiversifiable risk. Since all investment securities are affected, this risk cannot be offset through portfolio diversification.

One type of risk to which investment securities are subject can be offset through portfolio diversification. This type of risk is referred to as

A. Market risk.
B. Undiversifiable risk.
C. Liquidity risk.
D. Company risk.

Answer (A) is incorrect because Systematic risk, also called market or undiversifiable risk, is the risk faced by all firms. Since all investment securities are affected, this risk cannot be offset through portfolio diversification.

Answer (B) is incorrect because Undiversifiable risk is another name for market risk.

Answer (C) is incorrect because Liquidity risk is the risk that a security cannot be sold on short notice for its market value. If it has become known that the issuer may be in default, it is unlikely that the company will find a willing buyer for the bonds.

Answer (D) is correct. Unsystematic risk, also called company or diversifiable risk, is the risk inherent in a particular investment security. Since individual securities are affected by the particular strengths and weaknesses of the issuer, this risk can be offset through portfolio diversification.

A company holds industrial development bonds issued by a county in another state. The county commission has announced that its financial condition has changed drastically and that it is considering defaulting on the next interest and principal payment on these bonds. This situation exposes the company to all of the following types of risk except

A. Liquidity risk.
B. Interest rate risk.
C. Credit risk.
D. Political risk.

Answer (A) is incorrect because Liquidity risk is the risk that a security cannot be sold on short notice for its market value. If it has become known that the issuer may be in default, it is unlikely that the company will find a willing buyer for the bonds.

Answer (B) is correct. Interest rate risk is the risk that an investment security will fluctuate in value due to changes in interest rates. The potential default is based on the issuer’s financial condition, not the movement of interest rates in the market.

Answer (C) is incorrect because Credit risk is the risk that the issuer of a debt security will default.

Answer (D) is incorrect because Political risk is the probability of loss from actions of governments.
Which one of the following lists properly ranks financial instruments in order from the highest risk/opportunity for return to the lowest risk/opportunity for return?

B. Preferred stock, common stock, income bonds, debentures, mortgage bonds, U.S. Treasury bonds.
D. Common stock, preferred stock, income bonds, mortgage bonds, debentures, U.S. Treasury bonds.

- Answer (A) is correct. Common shareholders are the residual owners of a corporation; they stand last in order of priority during liquidation, but they have the right to receive distribution of excess profits. Preferred shareholders stand ahead of common shareholders in case of liquidation, but their potential returns are capped by the board of directors. Income bonds, debentures, mortgage bonds, and U.S. Treasury bonds are all debt securities, meaning the issuer is legally obligated to redeem them. Because these returns are guaranteed, they are lower than those for equity investments. Income bonds pay a return only if the issuer is profitable, debentures are unsecured, mortgage bonds are secured by real property, and U.S. Treasury bonds are backed by the full faith and credit of the United States government.
- Answer (B) is incorrect because Common stock is riskier and has a higher opportunity for return than preferred stock.
- Answer (C) is incorrect because Income bonds are riskier and have a higher opportunity for return than debentures and mortgage bonds.
- Answer (D) is incorrect because Debentures are riskier and have a higher opportunity for return than mortgage bonds.

---

An investor is considering the purchase of one of two common stocks. The projected returns for the two stocks and the probabilities for each are listed below:

<table>
<thead>
<tr>
<th>Marcel Company Stock</th>
<th>Gilberte Company Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of Return</td>
<td>Rate of Return</td>
</tr>
<tr>
<td>Probability</td>
<td>Probability</td>
</tr>
<tr>
<td>6.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>40%</td>
<td>25%</td>
</tr>
<tr>
<td>2.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>(2.0)%</td>
<td>(1.0)%</td>
</tr>
<tr>
<td>10%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Based on an expected rate of return calculation, which stock should the investor purchase?

A. Marcel Company’s, because its expected rate of return is slightly higher.
B. Gilberte Company’s, because its expected rate of return is slightly higher.
C. Marcel Company’s, because its weighted downside risk is lower.
D. Gilberte Company’s, because its weighted upside risk is higher.
Answer (A) is correct. The expected rates of return for the two stocks can be arrived at using a weighted-average calculation, as follows:

<table>
<thead>
<tr>
<th>Rate of Return</th>
<th>Weighted Probability</th>
<th>Marcel Company Stock</th>
<th></th>
<th>Gilberte Company Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0%</td>
<td>× 10%</td>
<td>0.60%</td>
<td></td>
<td>7.0%</td>
</tr>
<tr>
<td>4.0%</td>
<td>× 40%</td>
<td>1.60%</td>
<td></td>
<td>5.0%</td>
</tr>
<tr>
<td>2.0%</td>
<td>× 40%</td>
<td>0.80%</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>(2.0)%</td>
<td>× 10%</td>
<td>(0.20)%</td>
<td></td>
<td>(1.0)%</td>
</tr>
</tbody>
</table>

Expected rate of return: 2.80%  Expected rate of return: 2.75%

Answer (B) is incorrect because Marcel Company stock’s expected rate of return is higher than that of Gilberte Company. Answer (C) is incorrect because Marcel Company’s weighted downside risk is lower than Gilberte’s [(2.0% × 10%) < (1.0% × 25%)]. However, an expected rate of return calculation must be performed using the weighted average of all potential returns, not just the highest upside or lowest downside. Answer (D) is incorrect because Gilberte Company’s weighted upside risk is higher than Marcel’s [(7.0% × 25%) > (6.0% × 10%)]. However, an expected rate of return calculation must be performed using the weighted average of all potential returns, not just the highest upside or lowest downside.

[420] (Refers to Fact Pattern #62)

Based on a standard deviation ($\sigma$) calculation, which stock is riskier? (The expected rate of return of Marcel Company stock is 2.80% and that of Gilberte Company stock is 2.75%.)

A. Marcel.  
B. Gilberte.  
C. The two stocks are equally risky.  
D. Cannot be determined from standard deviation.

Answer (A) is incorrect because Marcel is the less risky of the two.
Answer (B) is correct. The standard deviation (\( \sigma \)) of the returns on an investment is the square root of the total weighted squared variances of all its possible returns. The weighted squared variance of a stock’s expected returns is arrived at by first calculating the variance between each potential return and the expected rate of return for the stock.

<table>
<thead>
<tr>
<th>Rate of Return</th>
<th>Expected Rate</th>
<th>Variance</th>
<th>Rate of Return</th>
<th>Expected Rate</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0 %</td>
<td>2.80%</td>
<td>3.20 %</td>
<td>7.0 %</td>
<td>2.75%</td>
<td>4.25 %</td>
</tr>
<tr>
<td>4.0 %</td>
<td>2.80%</td>
<td>1.20 %</td>
<td>5.0 %</td>
<td>2.75%</td>
<td>2.25 %</td>
</tr>
<tr>
<td>2.0 %</td>
<td>2.80%</td>
<td>(0.80)%</td>
<td>0.0 %</td>
<td>2.75%</td>
<td>(2.75)%</td>
</tr>
<tr>
<td>(2.0)%</td>
<td>2.80%</td>
<td>(4.80)%</td>
<td>(1.0)%</td>
<td>2.75%</td>
<td>(3.75)%</td>
</tr>
</tbody>
</table>

These variances are then squared and weighted by each return’s probability. These weighted squared variances are then summed.

<table>
<thead>
<tr>
<th>Rate of Return</th>
<th>Expected Rate</th>
<th>Variance</th>
<th>Rate of Return</th>
<th>Expected Rate</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0 %</td>
<td>2.80%</td>
<td>0.102%</td>
<td>7.0 %</td>
<td>2.75%</td>
<td>0.181%</td>
</tr>
<tr>
<td>4.0 %</td>
<td>2.80%</td>
<td>0.014%</td>
<td>5.0 %</td>
<td>2.75%</td>
<td>0.051%</td>
</tr>
<tr>
<td>2.0 %</td>
<td>2.80%</td>
<td>0.006%</td>
<td>0.0 %</td>
<td>2.75%</td>
<td>0.006%</td>
</tr>
<tr>
<td>(2.0)%</td>
<td>2.80%</td>
<td>0.230%</td>
<td>(1.0)%</td>
<td>2.75%</td>
<td>0.141%</td>
</tr>
<tr>
<td>Total weighted squared variance</td>
<td>0.042%</td>
<td>Total weighted squared variance</td>
<td>0.045%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\text{Marcel} = \sigma = \sqrt{0.042\%} = 2.04%
\]

\[
\text{Gilberte} = \sigma = \sqrt{0.112\%} = 3.34%
\]

Standard deviation (\( \sigma \)) is a measure of an investment’s risk. Gilberte, having the greater standard deviation, is the riskier investment.

- Answer (C) is incorrect because The two stocks are not equally risky.
- Answer (D) is incorrect because The relative riskiness of investments can be determined from the standard deviation (\( \sigma \)).

[421] In theory, which of the following coefficients of correlation would eliminate risk in an investment portfolio?

- A. 1.0
- B. 0.0
- C. –1.0
- D. No theoretical coefficient exists for the elimination of risk in a portfolio context.

- Answer (A) is incorrect because A coefficient of correlation of 1.0 indicates perfect positive correlation. Given perfect positive correlation, risk for a two-stock portfolio with equal investments in each stock would be the same as that for the individual assets.
- Answer (B) is incorrect because A coefficient of correlation of 0.0 indicates no correlation at all.
- Answer (C) is correct. The correlation coefficient measures the degree to which any two variables, e.g., two stocks in a portfolio, are related. Perfect negative correlation (–1.0) means that the two variables always move in the opposite direction. Given perfect negative correlation, risk would in theory be eliminated. In practice, the existence of market risk makes perfect correlation all but impossible.
Answer (D) is incorrect because the coefficient of correlation that would, in theory, eliminate risk in an investment portfolio is –1.0.

Listed below are four numbers. Which of these numbers represents the coefficient of correlation of a stock portfolio with the least risk?

A. 100.0
B. 1.0
C. 0.0
D. –1.0

Answer (A) is incorrect because the range of the coefficient of correlation is 1.0 to –1.0.
Answer (B) is incorrect because a coefficient of correlation of 1.0 indicates perfect positive correlation. Given perfect positive correlation, risk for a two-stock portfolio with equal investments in each stock would be the same as that for the individual assets.
Answer (C) is incorrect because a coefficient of correlation of 0.0 indicates no correlation at all.
Answer (D) is correct. The correlation coefficient measures the degree to which any two variables, e.g., two stocks in a portfolio, are related. Perfect negative correlation (–1.0) means that the two variables always move in the opposite direction. Given perfect negative correlation, risk would in theory be eliminated. In practice, the existence of market risk makes perfect correlation all but impossible.

The incremental benefits of portfolio diversification initially decrease as the number of different securities held increases. The benefits become extremely small when more than about __________ different securities are held.

A. 10 to 20.
B. 20 to 30.
C. 30 to 40.
D. 40 to 50.

Answer (A) is incorrect because in principle, diversifiable risk should continue to decrease as the number of different securities held increases. In practice, however, the benefits of diversification become extremely small when more than about 20 to 30 different securities are held.
Answer (B) is correct. In principle, diversifiable risk should continue to decrease as the number of different securities held increases. In practice, however, the benefits of diversification become extremely small when more than about 20 to 30 different securities are held.
Answer (C) is incorrect because in principle, diversifiable risk should continue to decrease as the number of different securities held increases. In practice, however, the benefits of diversification become extremely small when more than about 20 to 30 different securities are held.
Answer (D) is incorrect because in principle, diversifiable risk should continue to decrease as the number of different securities held increases. In practice, however, the benefits of diversification become extremely small when more than about 20 to 30 different securities are held.
OldTime, Inc., is a mature firm operating in a very stable market. Earnings growth has averaged about 3.2% for the last dozen years, just staying in line with inflation. The firm’s weighted-average cost of capital is 8%, much lower than most firms. John Storms has just been hired as OldTime’s new CEO and wants to turn what he calls a “cash cow” into a “growth company.” Storms wants to reduce the dividend pay-out and use the resulting retained earnings to fund the firm’s expansion into new product lines. OldTime’s historical beta has been about 0.6. With the CEO’s changes, what will most likely happen to OldTime’s beta and the required return on investment in its shares?

A. The beta will fall, and the required return will rise.
B. The beta will fall, and the required return will fall.
C. The beta will rise, and the required return will fall.
D. The beta will rise, and the required return will rise.

- Answer (A) is incorrect because Expanding into new product lines will cause the historical beta to increase, not decrease, as the company will take on more risk.
- Answer (B) is incorrect because Expanding into new product lines will cause the historical beta to increase, not decrease, as the company will take on more risk. This will therefore increase the required rate of return.
- Answer (C) is incorrect because Because the beta is rising, the required rate of return will also rise, as per the required rate of return formula.
- Answer (D) is correct. The required rate of return is equal to the risk-free return plus the beta times the market return less the risk-free return. If OldTime starts expanding into new product lines, the historical beta will increase, as the company will be taking on more risk with these new changes and investments. This will also increase the required rate of return, as per the formula.

Using the capital asset pricing model (CAPM), determine the expected market risk premium from the following information.

<table>
<thead>
<tr>
<th>Beta of Investment A</th>
<th>1.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-free return</td>
<td>3.0%</td>
</tr>
<tr>
<td>Expected return on Investment A</td>
<td>7.4%</td>
</tr>
</tbody>
</table>

A. 3.14%
B. 6.14%
C. 7.43%
D. 8.28%
Answer (A) is correct. The CAPM formula is expressed as follows:

\[ \text{Required rate of return} = R_F + \beta (R_M - R_F) \]

Where:
- \( R_F \) = Risk-free return
- \( R_M \) = Market return
- \( \beta \) = Measure of the systematic risk or volatility of the individual security in comparison to the market (diversified portfolio)

The market risk premium is equal to the market return less the risk-free rate. Thus, the CAPM formula can also be expressed as follows:

\[ \text{Required rate of return} = R_F + \beta (\text{Market risk premium}) \]

The market risk premium in this question can be calculated as follows:

\[
\begin{align*}
7.4\% &= 3.0\% + 1.4 \times (\text{Market risk premium}) \\
4.4\% &= 1.4 \times (\text{Market risk premium})
\end{align*}
\]

3.14% = Market risk premium

Answer (B) is incorrect because The amount of 6.14% is found by solving for the market rate of return, not the market risk premium. The market risk premium is equal to the market rate of return less the risk-free return.

Answer (C) is incorrect because The CAPM formula is expressed as follows: Required rate of return = Risk-free return + \( \beta \) (Market return – Risk-free return). The amount of 7.43% incorrectly adds the risk-free return with the expected rate of return and then divides them by the beta.

Answer (D) is incorrect because The CAPM formula is expressed as follows: Required rate of return = Risk-free return + \( \beta \) (Market return – Risk-free return). The amount of 8.28% incorrectly divides the expected return by the beta and then adds the risk-free return of return to this number.

If the return on the market portfolio is 10% and the risk-free rate is 5%, what is the effect on a company’s required rate of return on its stock of an increase in the beta coefficient from 1.2 to 1.5?

A. 3% increase.
B. 1.5% increase.
C. No change.
D. 1.5% decrease.

Answer (A) is incorrect because The market return times the increase in the beta equals 3%.

Answer (B) is correct. The required rate of return on equity capital can be estimated with the capital asset pricing model (CAPM). CAPM consists of adding the risk-free rate (i.e., the return on government securities, denoted \( R_F \)) to the product of the beta coefficient (a measure of the issuer’s risk) and the difference between the market return and the risk-free rate (denoted \( R_M - R_F \), referred to as the risk premium). Below is the basic equilibrium equation for the CAPM:

\[ \text{Required rate of return} = R_F + \beta (R_M - R_F) \]

In this situation, the risk premium is 5% (10% – 5%). Thus, the required rate of return when the beta coefficient is 1.2 is 11% \([5\% + (1.2 \times 5\%)]\), and when the beta coefficient is 1.5, the required rate is 12.5% \([5\% + (1.5 \times 5\%)]\). This is an increase of 1.5% \((12.5\% - 11\%)\).

Answer (C) is incorrect because The company’s required rate of return is affected by a change in the company’s beta coefficient.

Answer (D) is incorrect because The change results in an increase of the company’s required rate of return, not a decrease.
The betas and expected returns for three investments being considered by Sky, Inc., are given below.

<table>
<thead>
<tr>
<th>Investment</th>
<th>Beta</th>
<th>Expected Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.4</td>
<td>12%</td>
</tr>
<tr>
<td>B</td>
<td>0.8</td>
<td>11%</td>
</tr>
<tr>
<td>C</td>
<td>1.5</td>
<td>13%</td>
</tr>
</tbody>
</table>

The return on the market is 11% and the risk-free rate is 6%. If the capital asset pricing model (CAPM) is used for calculating the required rate of return, which investments should the management of Sky make?

A. B only.  
B. A and C only.  
C. B and C only.  
D. A, B, and C.

Answer (A) is correct. The required rate of return on equity capital can be estimated with the capital asset pricing model (CAPM). CAPM consists of adding the risk-free rate (i.e., the return on government securities, denoted \( R_F \)) to the product of the beta coefficient (a measure of the issuer’s risk) and the difference between the market return and the risk-free rate (denoted \( R_M - R_F \), referred to as the risk premium). Below is the basic equilibrium equation for the CAPM:

\[
\text{Required rate of return} = R_F + \beta (R_M - R_F)
\]

The risk premium is 5% (11% – 6%).

The CAPM can be thus applied to each of the three investments as follows:

- Investment A: 6% + (1.4 × 5%) = 13.0%
- Investment B: 6% + (0.8 × 5%) = 10.0%
- Investment C: 6% + (1.5 × 5%) = 13.5%

These required rates of return can be compared to the expected rates to evaluate which investments should be accepted and which should be rejected.

<table>
<thead>
<tr>
<th>Required Rate</th>
<th>Expected Rate</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment A</td>
<td>13.0% &gt; 12%</td>
<td>Reject</td>
</tr>
<tr>
<td>Investment B</td>
<td>10.0% &lt; 11%</td>
<td>Accept</td>
</tr>
<tr>
<td>Investment C</td>
<td>13.5% &gt; 13%</td>
<td>Reject</td>
</tr>
</tbody>
</table>

- Answer (B) is incorrect because the required rates of return for Investment A and Investment C exceed their expected returns.  
- Answer (C) is incorrect because the required rate of return for Investment C exceeds its expected return.  
- Answer (D) is incorrect because the required rates of return for Investment A and Investment C exceed their expected returns.
The common stock of Wisconsin’s Finest Cheese has a beta coefficient of 1.7. The following information about overall market conditions is available.

| Expected return on U.S. Treasury bonds | 6% |
| Expected return on the market portfolio | 8.5% |

Using the capital asset pricing model (CAPM), what is the risk premium on the market?

A. 10.3%
B. 4.3%
C. 2.5%
D. 1.7%

- Answer (A) is incorrect because this figure is the expected return on the stock.
- Answer (B) is incorrect because this figure is the risk premium on the stock, not the market.
- Answer (C) is correct. The risk premium on the market is the return on the market portfolio (8.5%) minus the risk-free return as measured by the return on U.S. Treasury securities (6%), or 2.5%.
- Answer (D) is incorrect because the stock’s beta coefficient and the risk premium on the market are not the same in this case.

A firm must select from among several methods of financing arrangements when meeting its capital requirements. To acquire additional growth capital while attempting to maximize earnings per share, a firm should normally

A. Attempt to increase both debt and equity in equal proportions, which preserves a stable capital structure and maintains investor confidence.
B. Select debt over equity initially, even though increased debt is accompanied by interest costs and a degree of risk.
C. Select equity over debt initially, which minimizes risk and avoids interest costs.
D. Discontinue dividends and use current cash flow, which avoids the cost and risk of increased debt and the dilution of EPS through increased equity.

- Answer (A) is incorrect because EPS is not a function of investor confidence and is not maximized by concurrent proportional increases in both debt and equity. EPS is usually higher if debt is used instead of equity to raise capital, at least initially.
- Answer (B) is correct. Earnings per share will ordinarily be higher if debt is used to raise capital instead of equity, provided that the firm is not over-leveraged. The reason is that the cost of debt is lower than the cost of equity because interest is tax deductible. However, the prospect of higher EPS is accompanied by greater risk to the firm resulting from required interest costs, creditors’ liens on the firm’s assets, and the possibility of a proportionately lower EPS if sales volume fails to meet projections.
- Answer (C) is incorrect because equity capital is initially more costly than debt.
- Answer (D) is incorrect because using only current cash flow to raise capital is usually too conservative an approach for a growth-oriented firm. Management is expected to be willing to take acceptable risks to be competitive and attain an acceptable rate of growth.
Duration hedging involves hedging interest-rate risk by matching the duration of assets with the duration of liabilities. Which of the following is a true statement about duration hedging?

A. If duration increases, the volatility of the price of a debt instrument decreases.
B. The goal of duration hedging is to equate the duration of assets with the duration of liabilities.
C. The firm is immunized against interest-rate risk when the total price change for assets equals the total price change for liabilities.
D. Duration is higher if the nominal rate on a debt instrument is higher.

- Answer (A) is incorrect because if duration increases, the volatility of the price of a debt instrument increases.
- Answer (B) is incorrect because the goal is to equate the total price change for assets and the total price change for liabilities.
- Answer (C) is correct. The goal of duration hedging is not to equate the duration of assets and the duration of liabilities but for the following relationship to apply:
  \[
  (\text{Value of assets}) \times (\text{Duration of assets}) = (\text{Value of liabilities}) \times (\text{Duration of liabilities})
  \]
  The firm is immunized against interest-rate risk when the total price change for assets equals the total price change for liabilities.
- Answer (D) is incorrect because duration is lower if the nominal rate on a debt instrument is higher.

Business risk is the risk inherent in a firm’s operations that excludes financial risk. It depends on all of the following factors except the

A. Amount of financial leverage.
B. Sales price variability.
C. Demand variability.
D. Input price variability.

- Answer (A) is correct. Business risk is the risk of fluctuations in earnings before interest and taxes or in operating income when the firm uses no debt. It depends on factors such as demand variability, sales price variability, input price variability, and the amount of operating leverage. Financial leverage affects financial risk and is not a factor affecting business risk.
- Answer (B) is incorrect because sales price variability is a factor affecting business risk.
- Answer (C) is incorrect because demand variability is a factor affecting business risk.
- Answer (D) is incorrect because input price variability is a factor affecting business risk.

A firm with a higher degree of operating leverage when compared to the industry average implies that the

A. Firm has higher variable costs.
B. Firm’s profits are more sensitive to changes in sales volume.
C. Firm is more profitable.
D. Firm is less risky.

- Answer (A) is incorrect because a firm with higher operating leverage has higher fixed costs and lower variable costs.
Answer (B) is correct. Operating leverage is a measure of the degree to which fixed costs are used in the production process. A company with a higher percentage of fixed costs (higher operating leverage) has greater risk than one in the same industry that relies more heavily on variable costs. However, such a firm is also able to expand production rapidly in times of higher product demand. Thus, the more leveraged a firm is in its operations, the more sensitive operating income is to changes in sales volume.

Answer (C) is incorrect because a firm with higher leverage will be relatively more profitable than a firm with lower leverage when sales are high. The opposite is true when sales are low.

Answer (D) is incorrect because a firm with higher leverage is more risky. Its reliance on fixed costs is greater.

[433] Business risk excludes such factors as

A. Financial risk.
B. Amount of operating leverage.
C. Demand variability.
D. Fluctuations in suppliers’ prices.

Answer (A) is correct. Business risk is the risk of fluctuations in earnings before interest and taxes or in operating income when the firm uses no debt. It is the risk inherent in its operations that excludes financial risk, which is the risk to the shareholders from the use of financial leverage. Business risk depends on factors such as demand variability, sales price variability, input price variability, and amount of operating leverage.

Answer (B) is incorrect because business risk depends on such factors as amount of operating leverage.

Answer (C) is incorrect because business risk depends on such factors as demand variability.

Answer (D) is incorrect because business risk depends on such factors as fluctuations in suppliers’ prices.

[434] Sylvan Corporation has the following capital structure:

<table>
<thead>
<tr>
<th>Capital Structure</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debenture bonds</td>
<td>$10,000,000</td>
</tr>
<tr>
<td>Preferred equity</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Common equity</td>
<td>39,000,000</td>
</tr>
</tbody>
</table>

The financial leverage of Sylvan Corporation would increase as a result of

A. Issuing common stock and using the proceeds to retire preferred stock.
B. Maintaining the same dollar level of cash dividends as the prior year, even though earnings have increased by 7%.
C. Financing its future investments with a higher percentage of bonds.
D. Financing its future investments with a higher percentage of equity funds.

Answer (A) is incorrect because the issuance of common stock does not increase financial leverage. No increase in borrowed capital and fixed interest charges occurs when equity is issued.

Answer (B) is incorrect because a decrease in the dividend payout ratio would result in increased owners’ equity (retained earnings), and would not increase debt capital and financial leverage.

Answer (C) is correct. Financial leverage is the use of borrowed money to earn money for the benefit of shareholders. The expectation is that investment earnings will be greater than the interest paid on the borrowed funds. Increasing debt (such as bonds) increases financial leverage.

Answer (D) is incorrect because using equity funds to finance new investments decreases financial leverage.
An indifference curve represents combinations of portfolios having equal utility to the investor. Given that risk and returns are plotted on the horizontal and vertical axes, respectively, and that the investor is risk averse, the curve has

A. An increasingly steeper slope if the investor is less risk averse.
B. A decreasingly negative slope if the investor’s utility increases.
C. An increasingly positive slope.
D. A decreasingly positive slope.

- Answer (A) is incorrect because The slope is less steep if the investor is less risk averse. The increase in the required additional return per unit of additional risk is lower.
- Answer (B) is incorrect because The higher the curve, the greater is the investor’s level of utility. Moreover, the slope is positive, not negative.
- Answer (C) is correct. An indifference curve represents combinations of portfolios having equal utility to the investor. Given that risk and returns are plotted on the horizontal and vertical axes, respectively, and that the investor is risk averse, the curve has an increasingly positive slope. As risk increases, the additional required return per unit of additional risk also increases. The steeper the slope of an indifference curve, the more risk averse an investor is. The higher the curve, the greater is the investor’s level of utility.
- Answer (D) is incorrect because The slope is increasingly positive.

An automobile company that uses the futures market to set the price of steel to protect a profit against price increases is

A. A short hedge.
B. A long hedge.
C. Selling futures to protect the company from loss.
D. Selling futures to protect against price declines.

- Answer (A) is incorrect because A short hedge is a futures contract that is sold to protect against price declines. The automobile company wishes to protect itself against price increases.
- Answer (B) is correct. A change in prices can be minimized or avoided by hedging. Hedging is the process of using offsetting commitments to minimize or avoid the impact of adverse price movements. The automobile company desires to stabilize the price of steel so that its cost to the company will not rise and cut into profits. Accordingly, the automobile company uses the futures market to create a long hedge, which is a futures contract that is purchased to protect against price increases.
- Answer (C) is incorrect because The automobile company needs to purchase futures in order to protect itself from loss, not sell futures. Selling futures protects against price declines.
- Answer (D) is incorrect because It is the definition of a short hedge, which is used for avoiding price declines. The automobile company wants to protect itself against price increases.

Which of the following is not a valid reason for a company to hedge exchange rate risk?

A. Firms may benefit from economies of scale when hedging in forward or money markets, while individual shareholders may not.
B. When a firm’s cash flows are highly variable, the chance of financial distress is greater, and financial distress is costly in imperfect markets.
C. Short selling is often difficult for the individual shareholders.
D. Hedging a foreign-currency inflow is beneficial when the forward rate is at a premium, because the hedge is profitable and therefore desirable.
Answer (A) is incorrect because this is a valid reason for a company to use hedging.

Answer (B) is incorrect because this is a valid reason for a company to use hedging.

Answer (C) is incorrect because this is a valid reason for a company to use hedging.

Answer (D) is correct. The forward rate is merely the risk-adjusted expected value of the future (unknown spot rate). Thus, a premium or discount on a forward rate has no meaning with respect to the value of a hedging transaction.

[438] Which of the following is not an example of a natural hedge?

A. Buying an insurance policy.
B. Buying stock in Coca-Cola and selling Pepsi short.
C. Pair trading.
D. A wheat farmer selling a wheat futures contract.

Answer (A) is incorrect because this is an example of a natural hedge.

Answer (B) is incorrect because this is an example of a natural hedge.

Answer (C) is incorrect because this is an example of a natural hedge.

Answer (D) is correct. A natural hedge is a method of reducing risk by investing in two different items whose performance tends to cancel each other. A natural hedge does not involve the use of sophisticated financial tools such as derivatives or futures contracts. A wheat farmer who sells a wheat futures contract is using hedging (a short hedge) to protect against future price declines. It is not an example of a natural hedge.

[439] Contracts to hedge risk by exchanging cash flows include

<table>
<thead>
<tr>
<th>Interest-Rate Swaps</th>
<th>Currency Swaps</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>B. Yes</td>
<td>No</td>
</tr>
<tr>
<td>C. No</td>
<td>Yes</td>
</tr>
<tr>
<td>D. No</td>
<td>No</td>
</tr>
</tbody>
</table>

Answer (A) is correct. Swaps are contracts to hedge risk by exchanging cash flows. In an interest-rate swap, one firm exchanges its fixed interest and principal payments for a series of payments based on a floating rate. If a firm has debt with fixed charges, but its revenues fluctuate with interest rates, it may prefer to swap for cash outflows based on a floating rate. The advantage is that revenues and the amounts of debt service will then move in the same direction, and interest-rate risk will be reduced. A currency swap is an exchange of an obligation to pay out cash flows denominated in one currency for an obligation to pay in another. For example, a U.S. firm with revenues in francs has to pay suppliers and workers in dollars, not francs. To minimize exchange-rate risk, it might agree to exchange francs for dollars held by a firm that needs francs. The exchange rate will be an average of the rates expected over the life of the agreement.

Answer (B) is incorrect because Contracts to hedge risk by exchanging cash flows include interest-rate swaps and currency swaps.

Answer (C) is incorrect because Contracts to hedge risk by exchanging cash flows include interest-rate swaps and currency swaps.

Answer (D) is incorrect because Contracts to hedge risk by exchanging cash flows include interest-rate swaps and currency swaps.
The capital structure of four corporations is as follows:

<table>
<thead>
<tr>
<th>Corporation</th>
<th>Sterling</th>
<th>Cooper</th>
<th>Warwick</th>
<th>Pane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term debt</td>
<td>10%</td>
<td>10%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>40%</td>
<td>35%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Common equity</td>
<td>20%</td>
<td>25%</td>
<td>25%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Which corporation is the most highly leveraged?

A. Sterling.
B. Cooper.
C. Warwick.
D. Pane.

- **Answer (A) is correct.** Financial leverage measures the effect of the use of fixed costs in a firm’s financing structure. The more debt a firm has, the more highly leveraged it is, because the payment of interest on debt is a legal obligation (unlike dividends). Half (10% + 40%) of Sterling’s financing structure is debt, which is more than any of the other three firms.
- **Answer (B) is incorrect because** Debt makes up only 45% of Cooper’s financing structure.
- **Answer (C) is incorrect because** Debt makes up only 45% of Warwick’s financing structure.
- **Answer (D) is incorrect because** Debt makes up only 40% of Pane’s financing structure.

Bellcon is investigating the two projects shown below.

<table>
<thead>
<tr>
<th>Investment</th>
<th>Required Return</th>
<th>Holding Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment A</td>
<td>5.75%</td>
<td>4 years</td>
</tr>
<tr>
<td>Investment B</td>
<td>6.25%</td>
<td>4 years</td>
</tr>
</tbody>
</table>

What is the most reasonable conclusion based on this limited information?

A. Investment A is the better choice for Bellcon.
B. Investment B is the better choice for Bellcon.
C. Investment A has greater risk than Investment B.
D. Investment B has greater risk than Investment A.

- **Answer (A) is incorrect because** There is not enough information to determine what Bellcon’s attitude is toward risk. Bellcon could be risk averse, risk neutral, or risk seeking. Therefore, the better investment for Bellcon cannot be determined from the information provided.
- **Answer (B) is incorrect because** There is not enough information to determine what Bellcon’s attitude is toward risk. Bellcon could be risk averse, risk neutral, or risk seeking. Therefore, the better investment for Bellcon cannot be determined from the information provided.
- **Answer (C) is incorrect because** Generally, the higher the return on a project, the riskier it is. Because the required return on Investment B is higher than the required return on Investment A, Investment A does not have a greater risk than Investment B.
Answer (D) is correct. Generally, the higher the return on a project, the riskier it is. Because the required return on Investment B is higher than the required return on Investment A, it can be reasonably concluded that Investment B has a greater risk than Investment A.

[442] The term structure of interest rates is the relationship of

A. Interest rates over different structures of bonds.
B. Interest rates over different structures of securities.
C. Interest rates over time.
D. The maturity dates of an issuance of bonds.

- Answer (A) is incorrect because Term structure is the relationship of interest rates over time, not different structures of bonds.
- Answer (B) is incorrect because Term structure is the relationship of interest rates over time, not different structures of securities.
- Answer (C) is correct. The term structure of interest rates is the relationship of interest rates and years to maturity. Corporate treasurers use the term structure to decide whether to borrow short-term debt or long-term debt. Investors use the term structure to decide whether to buy short-term or long-term bonds.
- Answer (D) is incorrect because Maturity dates refer to the time element, but the interest rate element is missing.

[443] A curve on a graph with the rate of return on the vertical axis and time on the horizontal axis depicts

A. The internal rate of return on an investment.
B. A yield curve showing the term structure of interest rates.
C. The present value of future returns, discounted at the marginal cost of capital, minus the present value of the cost.
D. A series of payments of a fixed amount for a specified number of years.

- Answer (A) is incorrect because The internal rate of return is the interest rate at which the present value of the expected future net cash inflows is equal to the cost of the investment.
- Answer (B) is correct. The term structure of interest rates is the relationship between long- and short-term interest rates, that is, between yield to maturity and time to maturity. It is graphically depicted by a yield curve with a rate of return on the vertical axis and time to maturity on the horizontal axis. If short-term rates are higher than long-term rates, the curve will be downward sloping. If the reverse is true, the curve will be upward sloping.
- Answer (C) is incorrect because It states the definition of net present value.
- Answer (D) is incorrect because This series is an annuity.

[444] The term structure of interest rates is depicted by a yield curve. What variables are plotted on the horizontal axis and on the vertical axis?

A. Interest rates and the inflation rates, respectively.
B. Years to maturity and the interest rates, respectively.
C. Real risk-free rate and the inflation rate, respectively.
D. Years to maturity and the real risk-free rate, respectively.

- Answer (A) is incorrect because The yield curve plots the interest rates on the vertical axis and years to maturity on the horizontal axis.
Answer (B) is **correct**. The term structure of interest rates is the relationship between long- and short-term interest rates. The term structure is graphically depicted by a yield curve. The interest rate is plotted on the vertical axis, and the years to maturity is plotted on the horizontal axis. The yield curve may change in both slope and position over time.

Answer (C) is incorrect because the yield curve plots the interest rates on the vertical axis and years to maturity on the horizontal axis.

Answer (D) is incorrect because the yield curve plots the interest rates on the vertical axis and years to maturity on the horizontal axis.

**[445]** A downward-sloping yield curve depicting the term structure of interest rates implies that

A. Interest rates have declined over recent years.
B. Interest rates have increased over recent years.
C. Prevailing short-term interest rates are lower than prevailing long-term interest rates.
D. Prevailing short-term interest rates are higher than prevailing long-term interest rates.

- **Answer (A) is incorrect because the yield curve does not reflect past interest rate trends.**
- **Answer (B) is incorrect because the yield curve does not reflect past interest rate trends.**
- **Answer (C) is incorrect because the downward-sloping yield curve implies that prevailing short-term interest rates are higher than prevailing long-term interest rates.**
- **Answer (D) is correct.** The term structure of interest rates is the relationship between long- and short-term interest rates, that is, between yield to maturity and time to maturity. It is graphically depicted by a yield curve with a rate of return on the vertical axis and time to maturity on the horizontal axis. If short-term rates are higher than long-term rates, the curve will be downward sloping. If the reverse is true, the curve will be upward sloping.

**[446]** The yield curve depicting the term structure of interest rates

A. Holds the default risk constant.
B. Is usually downward sloping.
C. Never changes the slope.
D. Shows the relationship between inflation and years to maturity.

- **Answer (A) is correct.** The yield curve graphically depicts the relationship between interest rates and years to maturity. When plotting a yield curve, several factors are held constant. These include default risk, taxability, callability, and sinking fund provisions. Over time, the yield curve changes in slope and position.
- **Answer (B) is incorrect because historically, most long-term rates have been above short-term rates, so the yield curve usually has been upward sloping.**
- **Answer (C) is incorrect because the yield curve changes over time in position and slope.**
- **Answer (D) is incorrect because Yield curves show the relationship between long- and short-term interest rates.**

**[447]** Increases in interest rates affect bonds and stocks

A. Causing the bond prices to increase and the yields to decrease, while causing stock prices to decline.
B. Causing the stock prices to decline and the bond prices to decline.
C. Because the higher rate has a positive economic effect.
D. Causing bond and stock sales to decrease.
Answer (A) is incorrect because Higher interest rates cause the prices of bonds to fall and the yields to increase. 
Answer (B) is correct. Higher interest rates result in lower prices for bonds and higher yields, thus making bonds more attractive to investors. As investors remove capital from the stock market to invest in bonds, stock prices decline. The higher rates also have a negative effect on economic activity, further reducing stock prices. 
Answer (C) is incorrect because Higher interest rates have a negative effect on economic activity. 
Answer (D) is incorrect because Bonds look better to investors because of lower prices and higher yields.

Short-term interest rates are

A. Usually lower than long-term rates.  
B. Usually higher than long-term rates.  
C. Lower than long-term rates during periods of high inflation only.  
D. Not significantly related to long-term rates.

Answer (A) is correct. Historically, one facet of the term structure of interest rates (the relationship of yield and time to maturity) is that short-term interest rates have ordinarily been lower than long-term rates. One reason is that less risk is involved in the short run. Moreover, future expectations concerning interest rates affect the term structure. Most economists believe that a long-term interest rate is an average of future expected short-term interest rates. For this reason, the yield curve will slope upward if future rates are expected to rise, downward if interest rates are anticipated to fall, and remain flat if investors think the rate is stable. Future inflation is incorporated into this relationship. Another consideration is liquidity preference: Investors in an uncertain world will accept lower rates on short-term investments because of their greater liquidity, whereas business debtors often prefer to pay higher rates on long-term debt to avoid the hazards of short-term maturities. 
Answer (B) is incorrect because Short-term rates are usually lower than long-term rates. 
Answer (C) is incorrect because Short-term rates are more likely to be greater than long-term rates if current levels of inflation are high. 
Answer (D) is incorrect because Long-term rates may be viewed as short-term rates adjusted by a risk factor.

Which of the following scenarios would encourage a company to use short-term loans to retire its 10-year bonds that have 5 years until maturity?

A. The company expects interest rates to increase over the next 5 years.  
B. Interest rates have increased over the last 5 years.  
C. Interest rates have declined over the last 5 years.  
D. The company is experiencing cash flow problems.

Answer (A) is incorrect because The company will not benefit from short-term loans if interest rates rise. 
Answer (B) is incorrect because The company should maintain the existing debt if prevailing interest rates are higher. 
Answer (C) is correct. If interest rates have declined, refunding with short-term debt may be appropriate. The bonds pay a higher interest rate than the new short-term debt. Assuming that rates continue to fall, the short-term debt can itself be refunded with debt having a still lower interest charge. The obvious risk is that interest rates may rise, thereby compelling the company to choose between paying off the debt or refunding it at higher rates. 
Answer (D) is incorrect because The company increases the cash flow problem by shifting to short-term loans.
The yield curve shown implies that the

A. Credit risk premium of corporate bonds has increased.
B. Credit risk premium of municipal bonds has increased.
C. Long-term interest rates have a higher annualized yield than short-term rates.
D. Short-term interest rates have a higher annualized yield than long-term rates.

- Answer (A) is incorrect because The yield curve does not reflect the credit risk premium of bonds.
- Answer (B) is incorrect because The yield curve does not reflect the credit risk premium of bonds.
- Answer (C) is correct. The term structure of interest rates is the relationship between yield to maturity and time to maturity. This relationship is depicted by a yield curve. Assuming the long-term interest rate is an average of expected future short-term rates, the curve will be upward sloping when future short-term interest rates are expected to rise. Furthermore, the normal expectation is for long-term investments to pay higher rates because of their higher risk. Thus, long-term interest rates have a higher annualized yield than short-term rates.
- Answer (D) is incorrect because Long-term interest rates should be higher than short-term rates.

The term “underwriting spread” refers to the

A. Commission percentage an investment banker receives for underwriting a security issue.
B. Discount investment bankers receive on securities they purchase from the issuing company.
C. Difference between the price the investment banker pays for a new security issue and the price at which the securities are resold.
D. Commission a broker receives for either buying or selling a security on behalf of an investor.

- Answer (A) is incorrect because The underwriting spread is not based on a commission. The underwriter actually buys the new securities and resells them at a price that is expected to result in a profit.
- Answer (B) is incorrect because The underwriting spread is not a genuine discount; it is simply the difference between the price paid and the price received for a new security.
- Answer (C) is correct. An investment banker performs an underwriting or insurance function when it purchases an issue of securities and then resells them. The risk of price fluctuations during the distribution period is borne entirely by the investment banker. Investment banking is also an efficient vehicle for marketing the securities because investment bankers are specialists in such activities. The profit earned is the underwriting spread, or the difference between the purchase and resale prices of the securities (effectively, the wholesale and retail prices).
- Answer (D) is incorrect because The underwriting spread is not based on a commission. The underwriter actually buys the new securities and resells them at a price that is expected to result in a profit.
Which one of the following characteristics distinguishes income bonds from other bonds?

A. The bondholder is guaranteed an income over the life of the security.
B. By promising a return to the bondholder, an income bond is junior to preferred and common stock.
C. Income bonds are junior to subordinated debt but senior to preferred and common stock.
D. Income bonds pay interest only if the issuing company has earned the interest.

- Answer (A) is incorrect because Bondholders will receive an income only if the issuing company earns sufficient income to pay the interest.
- Answer (B) is incorrect because All bonds have priority over preferred and common stock.
- Answer (C) is incorrect because Subordinated debt is junior to nonsubordinated debt.
- Answer (D) is correct.

If Brewer Corporation’s bonds are currently yielding 8% in the marketplace, why is the firm’s cost of debt lower?

A. Market interest rates have increased.
B. Additional debt can be issued more cheaply than the original debt.
C. There should be no difference; cost of debt is the same as the bonds’ market yield.
D. Interest is deductible for tax purposes.

- Answer (A) is incorrect because The tax deduction always causes the market yield rate to be higher than the cost of debt capital.
- Answer (B) is incorrect because Additional debt may or may not be issued more cheaply than earlier debt, depending upon the interest rates in the market place.
- Answer (C) is incorrect because The cost of debt is less than the yield rate given that bond interest is tax deductible.
- Answer (D) is correct.

Debentures are

A. Income bonds that require interest payments only when earnings permit.
B. Subordinated debt and rank behind convertible bonds.
C. Bonds secured by the full faith and credit of the issuing firm.
D. A form of lease financing similar to equipment trust certificates.

- Answer (A) is incorrect because Debentures must pay interest regardless of earnings levels.
- Answer (B) is incorrect because Debentures are not subordinated except to the extent of assets mortgaged against other bond issues. Debentures are a general obligation of the borrower and rank equally with convertible bonds.
- Answer (C) is correct. Debentures are unsecured bonds. Although no assets are mortgaged as security for the bonds, debentures are secured by the full faith and credit of the issuing firm. Debentures are a general obligation of the borrower. Only companies with the best credit ratings can issue debentures because only the company’s credit rating and reputation secure the bonds.
- Answer (D) is incorrect because Debentures have nothing to do with lease financing. Debentures are not secured by assets.
Serial bonds are attractive to investors because

A. All bonds in the issue mature on the same date.
B. The yield to maturity is the same for all bonds in the issue.
C. Investors can choose the maturity that suits their financial needs.
D. The coupon rate on these bonds is adjusted to the maturity date.

- Answer (A) is incorrect because Serial bonds mature on different dates.
- Answer (B) is incorrect because Bonds maturing on different dates may have different yields, or they may be the same. Usually, the earlier date maturities carry slightly lower yields than the later maturities.
- Answer (C) is correct. Serial bonds have staggered maturities; that is, they mature over a period (series) of years. Thus, investors can choose the maturity date that meets their investment needs. For example, an investor who will have a child starting college in 16 years can choose bonds that mature in 16 years.
- Answer (D) is incorrect because The coupon rate is the same for all bonds; only the selling price and yield differ.

The best advantage of a zero-coupon bond to the issuer is that the

A. Bond requires a low issuance cost.
B. Bond requires no interest income calculation to the holder or issuer until maturity.
C. Interest can be amortized annually by the APR method and need not be shown as an interest expense to the issuer.
D. Interest can be amortized annually on a straight-line basis but is a noncash outlay.

- Answer (A) is incorrect because The issuance costs are no lower than for any other bond issue.
- Answer (B) is incorrect because Interest income and expense must be calculated annually based on the amount of the initial discount that is amortized.
- Answer (C) is incorrect because The annual amortization must be shown as interest expense. APR means “annual percentage rate.”
- Answer (D) is correct. Zero-coupon bonds do not pay periodic interest. The bonds are sold at a discount from their face value, and the investors do not receive interest until the bonds mature. The issuer does not have to make annual cash outlays for interest. However, the discount must be amortized annually and reported as interest expense.

Junk bonds are

A. Securities rated at less than investment grade.
B. Worthless securities.
C. Securities that are highly risky but offer only low yields.
D. Considered illegal since the collapse of the Drexel Burnham Lambert firm.

- Answer (A) is correct. Junk bonds are high-risk and therefore high-yield securities that are normally issued when the debt ratio is very high. Thus, the bondholders have as much risk as the holders of equity securities. Such bonds are not highly rated by credit evaluation companies. Junk bonds have become accepted because of the tax deductibility of the interest paid.
- Answer (B) is incorrect because Junk bonds are not yet worthless; they simply bear high interest rates and high risk.
- Answer (C) is incorrect because Junk bonds typically offer high yields.
Answer (D) is incorrect because Drexel Burnham was not the only underwriter to package junk bonds, and they were never illegal.

[458] Which one of the following statements is true when comparing bond financing alternatives?

A. A bond with a call provision typically has a lower yield to maturity than a similar bond without a call provision.
B. A convertible bond must be converted to common stock prior to its maturity.
C. A call provision is generally considered detrimental to the investor.
D. A call premium requires the investor to pay an amount greater than par at the time of purchase.

- Answer (A) is incorrect because Callable bonds sometimes pay a slightly higher rate of interest. Investors may demand a greater return because of the uncertainty over the true maturity date.
- Answer (B) is incorrect because Conversion is at the option of the investor.
- Answer (C) is correct. A callable bond can be recalled by the issuer prior to maturity. A call provision is detrimental to the investor because the issuer can recall the bond when market interest rates decline. It is usually exercised only when a company wishes to refinance high-interest debt.
- Answer (D) is incorrect because The call premium is the amount in excess of par that the issuer must pay when bonds are called.

[459] Randolf Castell opened a small general store in 1964. A cousin, Alfred Bedford, served as bookkeeper and office manager while Castell concentrated on operations. The business prospered and each of Castell’s three sons joined their father in the business. In fact, as each son finished school, Castell opened a new store and put the son in charge. In time, each son began to specialize: one in hardware, another in dry goods, and the third in furniture. Further expansion took place, and the business was incorporated as Four Castles Inc., with all of the stock being held by the family. Castell closed his original store to serve as president and concentrate on administration. As Four Castles prospered and more stores opened, the company needed additional capital. Bedford suggested “going public” but pointed out that this required accounting and reporting procedures with which he was unfamiliar. Therefore, a trained and qualified accountant was hired as controller. The new controller has had to provide explanations to Castell and Bedford on the accounting and reporting requirements of public companies. From the viewpoint of the investor, which of the following securities provides the least risk?

A. Mortgage bond.
B. Subordinated debenture.
C. Income bond.
D. Debentures.

- Answer (A) is correct. A mortgage bond is secured with specific fixed assets, usually real property. Thus, under the rights enumerated in the bond indenture, creditors will be able to receive payments from liquidation of the property in case of default. In a bankruptcy proceeding, these amounts are paid before any transfers are made to other creditors, including those preferences. Hence, mortgage bonds are less risky than the others listed.
- Answer (B) is incorrect because A debenture is long-term debt that is not secured (collateralized) by specific property. Subordinated debentures have a claim on the debtor’s assets that may be satisfied only after senior debt has been paid in full. Debentures of either kind are therefore more risky than mortgage bonds.
- Answer (C) is incorrect because An income bond pays interest only if the debtor earns it. Such bonds are also more risky than secured debt.
- Answer (D) is incorrect because Unsecured debt is riskier than a mortgage bond.
From an investor’s viewpoint, the least risky type of bond in which to invest is a(n)  

A. Debenture bond.  
B. Deep discount bond.  
C. Income bond.  
D. Secured bond.  

- Answer (A) is incorrect because a debenture bond is backed only by the borrower’s general credit, not by specific collateral.  
- Answer (B) is incorrect because a deep discount bond is a bond sold for much less than its face value.  
- Answer (C) is incorrect because an income bond pays interest only if the issuing company has earnings; such bonds are riskier than other bonds.  
- Answer (D) is correct. A secured bond is backed by tangible property, making it the safest type for the investor of the four listed.

If a $1,000 bond sells for $1,125, which of the following statements are true?  

I. The market rate of interest is greater than the coupon rate on the bond.  
II. The coupon rate on the bond is greater than the market rate of interest.  
III. The coupon rate and the market rate are equal.  
IV. The bond sells at a premium.  
V. The bond sells at a discount.  

A. I and IV.  
B. I and V.  
C. II and IV.  
D. II and V.  

- Answer (A) is incorrect because if a bond sells at a premium, the market rate of interest is less than the coupon rate.  
- Answer (B) is incorrect because a bond sells at a discount when the price is less than the face amount.  
- Answer (C) is correct. The excess of the price over the face value is a premium. A premium is paid because the coupon rate on the bond is greater than the market rate of interest. In other words, because the bond is paying a higher rate than other similar bonds, its price is bid up by investors.  
- Answer (D) is incorrect because a bond sells at a discount when the price is less than the face amount.

All of the following may reduce the coupon rate on a bond issued at par except a  

A. Sinking fund.  
B. Call provision.  
C. Change in rating from Aa to Aaa.  
D. Conversion option.  

- Answer (A) is incorrect because a sinking fund is a feature attractive to investors that may result in their acceptance of a lower coupon rate.
Answer (B) is correct. A bond issued at par may carry a lower coupon rate than other similar bonds in the market if it has some feature that makes it more attractive to investors. For example, a sinking fund reduces default risk. Hence, investors may require a lower risk premium and be willing to accept a lower coupon rate. Other features attractive to investors include covenants in the bond indenture that restrict risky undertakings by the issuer and an option to convert the debt instruments to equity securities. The opportunity to profit from appreciation of the firm’s stock justifies a lower coupon rate. An improvement in a bond’s rating from Aa to Aaa (the highest possible) also justifies reduction in the risk premium and a lower coupon rate. However, a call provision is usually undesirable to investors. The issuer may take advantage of a decline in interest rates to recall the bond and stop paying interest before maturity.

Answer (C) is incorrect because An improved rating is a feature attractive to investors that may result in their acceptance of a lower coupon rate.

Answer (D) is incorrect because A conversion option is a feature attractive to investors that may result in their acceptance of a lower coupon rate.

[463] If a bond sells at a premium, the

A. Stated coupon rate must be less than the required market rate.
B. Nominal rate must be less than the yield rate.
C. Bond purchase price must be more than the fair market value of the bond.
D. Stated coupon rate must be more than the required market rate.

Answer (A) is incorrect because When the stated (coupon) rate is less than the effective rate, a bond sells at a discount.
Answer (B) is incorrect because To sell at a premium, the nominal (stated, or coupon) rate must be higher than the yield (effective, or market) rate.
Answer (C) is incorrect because The bond purchase price is, by definition, the fair market value of the bond on the date of issue.
Answer (D) is correct. If the stated, or coupon, rate of a bond is higher (lower) than the effective, or market, rate on the date of issue, the bonds sell at a premium (discount).

[464] A company issued a 15-year, $1,000 par value bond. The coupon rate on this bond is 9% annually, with interest being paid each 6 months. The investor who purchased the bond expects to earn a 12% nominal rate of return. The cash proceeds received by the company from the investor totaled

A. $619.43
B. $793.43
C. $875.38
D. $950.75

Answer (A) is incorrect because Failing to consider the maturity value of the bond results in $619.43.
Answer (B) is correct. The cash flows consist of interest of $45 every 6 months for 15 years (30 periods), and $1,000 at the end of the 30th interest period. The 12% discount rate translates to 6% every 6 months. Thus, the calculation is as follows:

Periodic interest \[13.765(30 \text{ periods} @ 6\%) \times $45 = 619.43\]
Maturity amount \[.174(6\%) \times $1,000 = 174.00\]
Total proceeds \[793.43\]

Answer (C) is incorrect because Using 15 annual periods instead of 30 half-year periods results in $875.38.
Answer (D) is incorrect because Using the wrong semi-annual interest results in $950.75.
What is the price of a 10-year, 10% coupon bond with a $1,000 face value if investors require a 12% return? Assume annual coupon payments.

A. $565.00
B. $322.00
C. $604.50
D. $887.00

- Answer (A) is incorrect because the amount of $565.00 only takes into account the coupon payment shown.
- Answer (B) is incorrect because the amount of $322.00 only takes into account the discounted face value payment included in the bond.
- Answer (C) is incorrect because the price of the bond if the bond had $50 coupon payments, not $100, is $604.50.
- Answer (D) is correct. The price of the bond is equal to the sum of present value of the face value of the bond and the present value of the interest payments. Thus, the price is $887.00 ($1,000 × .322 PV factor) + ($100 × 5.65 PV factor).

In calculating the total value of a bond, how much does the $1,000 to be received upon a bond’s maturity in 4 years add to the bond’s price if the discount rate is 6%?

A. $208.00
B. $747.00
C. $763.00
D. $792.00

- Answer (A) is incorrect because the complement of the correct answer is $208.00.
- Answer (B) is incorrect because the amount of $747.00 is for 5 years.
- Answer (C) is incorrect because the amount of $763.00 is for 7% instead of 6%.
- Answer (D) is correct. The 6% present value factor for 4 years is .792. Multiplying that times $1,000 results in a value of $792.00.

A firm is planning to issue a callable bond with an 8% coupon rate and 10 years to maturity. A straight bond with a similar rate is priced at $1,000. If the value of the issuer’s call option is estimated to be $50, what is the value of the callable bond?

A. $1,000
B. $950
C. $1,050
D. $900

- Answer (A) is incorrect because the call feature reduces the value of the bond by the value of the call option.
- Answer (B) is correct. A callable bond is not as valuable to an investor as a straight bond. Thus, the $50 call option is subtracted from the $1,000 value of a straight bond to arrive at a $950 value for the callable bond.
- Answer (C) is incorrect because the call feature reduces the value of the bond by the value of the call option.
- Answer (D) is incorrect because the call feature reduces the value of the bond by the value of the call option.
Which one of the following is a debt instrument that generally has a maturity of 10 years or more?

A. A bond.
B. A note.
C. A chattel mortgage.
D. A financial lease.

- Answer (A) is correct. A bond issue is a complex process, filled with legal and regulatory requirements. Entities rarely go to the trouble of preparing a bond issue if they expect to be able to retire the debt within 10 years.
- Answer (B) is incorrect because a note is a short-term debt instrument, usually with a maturity of 90 days or less.
- Answer (C) is incorrect because a chattel mortgage is a debt instrument secured by movable property, such as inventory; it does not necessarily have a maturity of 10 years or longer, because the collateral has a shorter life.
- Answer (D) is incorrect because financial leases may have terms shorter than 10 years.

The call provision in some bond indentures allows

A. The issuer to exercise an option to redeem the bonds.
B. The bondholder to exchange the bond, at no additional cost, for common shares.
C. The bondholder to redeem the bond early by paying a call premium.
D. The issuer to pay a premium in order to prevent bondholders from redeeming bonds.

- Answer (A) is correct. A call provision allows the bond issuer to exercise an option to redeem the bonds earlier than the specified maturity date.
- Answer (B) is incorrect because a provision that allows the bondholder to exchange the bond, at no additional cost, for common shares is a conversion, not a call provision.
- Answer (C) is incorrect because a call provision refers to an action by the bond issuer, not the bondholder.
- Answer (D) is incorrect because issuers cannot include a provision to prevent bondholders from redeeming bonds at the legally specified time and place.

Protective clauses set forth in an indenture are known as

A. Provisions.
B. Requirements.
C. Addenda.
D. Covenants.

- Answer (A) is incorrect because not all provisions in indentures are protective.
- Answer (B) is incorrect because “Requirements” is not a legally appropriate term in this context.
- Answer (C) is incorrect because “Addenda” is not a legally appropriate term in this context.
- Answer (D) is correct. Restrictive covenants, also known as protective clauses, in bond indentures are intended to prevent the issuer from taking actions not in the bondholders’ best interests. A trustee may be appointed to monitor compliance.
A requirement specified in an indenture agreement that states that a company cannot acquire or sell major assets without prior creditor approval is known as a

A. Protective covenant.  
B. Call provision.  
C. Warrant.  
D. Put option.

- Answer (A) is correct. Restrictive covenants, also known as protective clauses, in bond indentures are intended to prevent the issuer from taking actions not in the bondholders’ best interests. A trustee may be appointed to monitor compliance.
- Answer (B) is incorrect because A call provision allows the bond issuer to exercise an option to redeem the bonds earlier than the specified maturity date.
- Answer (C) is incorrect because Warrants are certificates evidencing options to buy stock at given price within a certain period.
- Answer (D) is incorrect because Put options are not included in bond indentures.

Dorsy Manufacturing plans to issue mortgage bonds subject to an indenture. Which of the following restrictions or requirements are likely to be contained in the indenture?

I. Receiving the trustee’s permission prior to selling the property.  
II. Maintain the property in good operating condition.  
III. Insuring plant and equipment at certain minimum levels.  
IV. Including a negative pledge clause.

A. I and IV only.  
B. II and III only.  
C. I, III, and IV only.  
D. I, II, III and IV.

- Answer (A) is incorrect because a mortgage bond issuer would likely also be required to maintain the property in good operating condition and insure the property against loss.
- Answer (B) is incorrect because a mortgage bond issuer would likely not be allowed to sell the secured property without receiving permission from the bond trustee or be allowed to pledge the property as security for any other loan.
- Answer (C) is incorrect because a mortgage bond issuer would likely also be required to maintain the property in good operating condition.
- Answer (D) is correct. Mortgage bonds are pledges of certain assets for a loan. They are usually secured by real property. The bond issuer would usually (i) not be allowed to sell the secured property without receiving permission from the bond trustee, (ii) be required to maintain the property in good operating condition, (iii) insure the property against loss, and (iv) not be allowed to pledge the property as security for any other loan.
[473] Which one of the following statements concerning debt instruments is correct?

A. The coupon rate and yield of an outstanding long-term bond will change over time as economic factors change.
B. A 25-year bond with a coupon rate of 9% and 1 year to maturity has more interest rate risk than a 10-year bond with a 9% coupon issued by the same firm with 1 year to maturity.
C. For long-term bonds, price sensitivity to a given change in interest rates is greater the longer the maturity of the bond.
D. A bond with 1 year to maturity would have more interest rate risk than a bond with 15 years to maturity.

- Answer (A) is incorrect because while a bond’s yield changes over time, a bond’s coupon rate is legally fixed at the time of issue.
- Answer (B) is incorrect because two bonds with equal coupon rates and equal remaining maturities bear equal interest rate risk, regardless of their original terms.
- Answer (C) is correct. The longer a bond’s term, the more time there is for interest rate volatility to affect a bond’s price, and thus the more sensitive is its price to interest rate changes.
- Answer (D) is incorrect because the shorter a bond’s term, the lower its interest rate risk.

[474] Which one of the following provides the best measure of interest rate risk for a corporate bond?

A. Duration.
B. Yield to maturity.
C. Bond rating.
D. Maturity.

- Answer (A) is correct. The longer a bond’s term, the more sensitive is its price to interest rate changes.
- Answer (B) is incorrect because yield to maturity does not provide the best measure of interest rate risk for a corporate bond.
- Answer (C) is incorrect because the rating does not provide the best measure of interest rate risk for a corporate bond.
- Answer (D) is incorrect because the maturity does not provide the best measure of interest rate risk for a corporate bond.

[475] What variable is measured on the horizontal axis of the yield curve?

A. Years to maturity of the bonds.
B. Yield of the bonds.
C. Duration of the bonds.
D. Par value of the bonds.
Answer (A) is correct. The term structure of interest rates is the relationship between yield to maturity and time to maturity. The yield curve is graphed with interest rate as the vertical axis and years to maturity as the horizontal axis.

Answer (B) is incorrect because The yield is measured on the vertical axis.
Answer (C) is incorrect because The duration of the bonds is not measured on the yield curve.
Answer (D) is incorrect because The par value of the bond is not measured on the yield curve.

In general, it is more expensive for a company to finance with equity capital than with debt capital because

A. Long-term bonds have a maturity date and must therefore be repaid in the future.
B. Investors are exposed to greater risk with equity capital.
C. Equity capital is in greater demand than debt capital.
D. Dividends fluctuate to a greater extent than interest rates.

Answer (A) is incorrect because The obligation to repay at a specific maturity date reduces the risk to investors and thus the required return.
Answer (B) is correct. Providers of equity capital are exposed to more risk than are lenders because the firm is not obligated to pay them a return. Also, in case of liquidation, creditors are paid before equity investors. Thus, equity financing is more expensive than debt because equity investors require a higher return to compensate for the greater risk assumed.
Answer (C) is incorrect because The demand for equity capital is directly related to its greater cost to the issuer.
Answer (D) is incorrect because Dividends are based on managerial discretion and may rarely change; interest rates, however, fluctuate daily based upon market conditions.

The par value of a common stock represents

A. The estimated market value of the stock when it was issued.
B. The liability ceiling of a shareholder when a company undergoes bankruptcy proceedings.
C. The total value of the stock that must be entered in the issuing corporation’s records.
D. A theoretical value of $100 per share of stock with any differences entered in the issuing corporation’s records as discount or premium on common stock.

Answer (A) is incorrect because Par value is rarely the same as market value. Normally, market value will be equal to or greater than par value, but there is no relationship between the two.
• Answer (B) is correct. Par value represents a stock’s legal capital. It is an arbitrary value assigned to stock before it is issued. Par value represents a shareholder’s liability ceiling because, as long as the par value has been paid in to the corporation, the shareholders obtain the benefits of limited liability.
• Answer (C) is incorrect because All assets received for stock must be entered into a corporation’s records. The amount received is very rarely the par value.
• Answer (D) is incorrect because Par value can be any amount more or less than $100.

[478] The equity section of Smith Corporation’s Statement of Financial Position is presented below.

<table>
<thead>
<tr>
<th>Preferred stock, $100 par</th>
<th>$12,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common stock, $5 par</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Paid-in capital in excess of par</td>
<td>18,000,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>9,000,000</td>
</tr>
<tr>
<td>Net worth</td>
<td>$49,000,000</td>
</tr>
</tbody>
</table>

The common shareholders of Smith Corporation have preemptive rights. If Smith Corporation issues 400,000 additional shares of common stock at $6 per share, a current holder of 20,000 shares of Smith Corporation’s common stock must be given the option to buy

A. 1,000 additional shares.
B. 3,774 additional shares.
C. 4,000 additional shares.
D. 3,333 additional shares.

• Answer (A) is incorrect because To arrive at 1,000 additional shares, the number of shares currently outstanding was incorrectly calculated as 8,000,000 [(12,000,000 + 10,000,000 + 18,000,000) ÷ $5].
• Answer (B) is incorrect because The investor would be allowed to purchase 1% of any new issues.
• Answer (C) is correct. Common shareholders usually have preemptive rights, which means they have first right to purchase any new issues of stock in proportion to their current ownership percentages. The purpose of a preemptive right is to allow stockholders to maintain their current percentages of ownership. Given that Smith had 2,000,000 shares outstanding ($10,000,000 ÷ $5 par), an investor with 20,000 shares has a 1% ownership. Hence, this investor must be allowed to purchase 4,000 (400,000 shares × 1%) of the additional shares.
• Answer (D) is incorrect because The investor would be allowed to purchase 1% of any new issues.

[479] Each share of nonparticipating, 8%, cumulative preferred stock in a company that meets its dividend obligations has all of the following characteristics except

A. Voting rights in corporate elections.
B. Dividend payments that are not tax deductible by the company.
C. No principal repayments.
D. A superior claim to common stock equity in the case of liquidation.

• Answer (A) is correct. Dividends on cumulative preferred stock accrue until declared; that is, the book value of the preferred stock increases by the amount of any undeclared dividends. Participating preferred stock participates with common shareholders in excess earnings of the company. In other words, 8% participating preferred stock might pay a dividend each year greater than 8% when the corporation is extremely profitable. Therefore, nonparticipating preferred stock will receive no more than is stated on the face of the stock. Preferred shareholders rarely have voting rights. Voting rights are exchanged for preferences regarding dividends and liquidation of assets.
Answer (B) is incorrect because a corporation does not receive a tax deduction for making dividend payments on any type of stock.

Answer (C) is incorrect because Preferred stock normally need not be redeemed as long as the corporation remains in business.

Answer (D) is incorrect because Preferred shareholders do have priority over common shareholders in a liquidation.

A financial manager usually prefers to issue preferred stock rather than debt because

A. Payments to preferred stockholders are not considered fixed payments.
B. The cost of fixed debt is less expensive since it is tax deductible even if a sinking fund is required to retire the debt.
C. The preferred dividend is often cumulative, whereas interest payments are not.
D. In a legal sense, preferred stock is equity; therefore, dividend payments are not legal obligations.

Answer (A) is incorrect because Preferred dividends are viewed as fixed payments since they must be made before any dividends or distributions in liquidation can be made to common shareholders.

Answer (B) is incorrect because it states a reason to issue debt, not preferred stock.

Answer (C) is incorrect because in the sense that they cannot be avoided, interest payments are cumulative.

Answer (D) is correct. For a financial manager, preferred stock is preferable to debt because dividends do not have to be paid on preferred stock, but failure to pay interest on debt could lead to bankruptcy. Thus, preferred stock is less risky than debt. However, debt has some advantages over preferred stock, the most notable of which is that interest payments are tax deductible. Preferred stock dividends are not.

The following excerpt was taken from a company’s financial statements: “... 10% convertible participating ... $10,000,000.” What is most likely being referred to?

A. Bonds.
B. Common stock.
C. Stock options.
D. Preferred stock.

Answer (A) is incorrect because Bonds normally have a coupon yield stated in percentage and may be convertible but are not participating.

Answer (B) is incorrect because Common stock is not described as convertible or participating on the financial statements.

Answer (C) is incorrect because Common stock options are not participating and do not have a stated yield rate.

Answer (D) is correct. Preferred shareholders have priority over common shareholders in the assets and earnings of the enterprise. If preferred dividends are cumulative, any past preferred dividends must be paid before any common dividends. Preferred stock may also be convertible into common stock, and it may be participating. For example, 10% fully participating preferred stock will receive additional distributions at the same rates as other shareholders if dividends paid to all shareholders exceed 10%.
Preferred and common stock differ in that

A. Failure to pay dividends on common stock will not force the firm into bankruptcy, while failure to pay dividends on preferred stock will force the firm into bankruptcy.
B. Common stock dividends are a fixed amount, while preferred stock dividends are not.
C. Preferred stock has a higher priority than common stock with regard to earnings and assets in the event of bankruptcy.
D. Preferred stock dividends are deductible as an expense for tax purposes, while common stock dividends are not.

- Answer (A) is incorrect because Failure to pay dividends will not force the firm into bankruptcy, whether the dividends are for common or preferred stock. Only failure to pay interest will force the firm into bankruptcy.
- Answer (B) is incorrect because Preferred dividends are fixed.
- Answer (C) is correct. In the event of bankruptcy, the claims of preferred shareholders must be satisfied before common shareholders receive anything. The interests of common shareholders are secondary to those of all other claimants.
- Answer (D) is incorrect because Neither common nor preferred dividends are tax deductible.

Unless the shares are specifically restricted, a holder of common stock with a preemptive right may share proportionately in all of the following except

A. The vote for directors.
B. Corporate assets upon liquidation.
C. Cumulative dividends.
D. New issues of stock of the same class.

- Answer (A) is incorrect because Common shareholders have the right to vote (although different classes of shares may have different privileges).
- Answer (B) is incorrect because Common shareholders have the right to share proportionately in corporate assets upon liquidation (but only after other claims have been satisfied).
- Answer (C) is correct. Common stock does not have the right to accumulate unpaid dividends. This right is often attached to preferred stock.
- Answer (D) is incorrect because Common shareholders have the right to share proportionately in any new issues of stock of the same class (the preemptive right).

Which of the following is usually not a feature of cumulative preferred stock?

A. Has priority over common stock with regard to earnings.
B. Has priority over common stock with regard to assets.
C. Has voting rights.
D. Has the right to receive dividends in arrears before common stock dividends can be paid.

- Answer (A) is incorrect because Preferred stock has priority over common stock with regard to earnings, so dividends must be paid on preferred stock before they can be paid on common stock.
- Answer (B) is incorrect because Preferred stock has priority over common stock with regard to assets. In the event of liquidation, for example, because of bankruptcy, the claims of preferred shareholders must be satisfied in full before the common shareholders receive anything.
Answer (C) is correct. Preferred stock does not usually have voting rights. Preferred shareholders are usually given the right to vote for directors only if the company has not paid the preferred dividend for a specified period of time, such as ten quarters. Such a provision is an incentive for management to pay preferred dividends.

Answer (D) is incorrect because Cumulative preferred stock has the right to receive any dividends not paid in prior periods before common stock dividends are paid.

[485] Which one of the following statements is correct regarding the effect preferred stock has on a company?

A. The firm’s after-tax profits are shared equally by common and preferred shareholders.
B. Control of the firm is now shared by the common and preferred shareholders, with preferred shareholders having greater control.
C. Preferred shareholders’ claims take precedence over the claims of common shareholders in the event of liquidation.
D. Nonpayment of preferred dividends places the firm in default, as does nonpayment of interest on debt.

Answer (A) is incorrect because The share of profits available to preferred stockholders is normally limited to a percentage of the stock’s par value. Thus, they may get more or less than the common shareholders.

Answer (B) is incorrect because Preferred stockholders ordinarily do not have voting rights.

Answer (C) is correct. Preferred stockholders have preference over common stockholders with respect to dividend and liquidation rights, but payment of preferred dividends, unlike bond interest is not mandatory. In exchange for these preferences, the preferred stockholders give up the right to vote. Consequently, preferred stock is a hybrid of debt and equity.

Answer (D) is incorrect because The passing of preferred dividends does not put the corporation into default. For this reason, preferred stock is sometimes viewed more favorably than debt by corporate management. If the preferred stock is cumulative (which most is), the corporation may not pay dividends to common shareholders until the arrearages to preferred stockholders have been paid.

[486] Preferred stock may be retired through the use of any one of the following except a

A. Conversion.
B. Call provision.
C. Refunding.
D. Sinking fund.

Answer (A) is incorrect because Preferred stock can be issued with a conversion feature.

Answer (B) is incorrect because Preferred stock can be issued with a call provision.

Answer (C) is correct. Preferred stock is equity. Only debt can be refunded.

Answer (D) is incorrect because A sinking fund can be established for preferred stock.

[487] All of the following are characteristics of preferred stock except that

A. It may be callable at the option of the corporation.
B. It may be converted into common stock.
C. Its dividends are tax deductible to the issuer.
D. It usually has no voting rights.
Answer (A) is incorrect because Preferred stock can be issued with a call provision.
Answer (B) is incorrect because Preferred stock can be issued with a conversion feature.
Answer (C) is correct. Dividends on stock, whether common or preferred, are not deductible for tax purposes.
Answer (D) is incorrect because Preferred stock can be issued with voting rights attached.

[488] Which one of the following describes a disadvantage to a firm that issues preferred stock?

A. Preferred stock dividends are legal obligations of the corporation.
B. Preferred stock typically has no maturity date.
C. Preferred stock is usually sold on a higher yield basis than bonds.
D. Most preferred stock is owned by corporate investors.

Answer (A) is incorrect because No dividends, even on cumulative preferred stock, are legal obligations of the corporation until they are declared.
Answer (B) is incorrect because Preferred stock is a form of equity, i.e., ownership. The lack of a maturity date is one of the strengths of preferred stock from the issuer’s standpoint.
Answer (C) is correct. Preferred stock must usually be sold on a higher yield basis than bonds because preferred stock stands behind bonds in priority at liquidation. An incentive must therefore be added to induce investors to purchase preferred stock. Since preferred stock is a riskier investment than bonds, investors demand a risk premium.
Answer (D) is incorrect because It is of no importance to the corporation whether its preferred stock is owned by other corporations or by private parties.

[489] Which one of the following situations would prompt a firm to issue debt, as opposed to equity, the next time it raises external capital?

A. High breakeven point.
B. Significant percentage of assets under capital lease.
C. Low fixed-charge coverage.
D. High effective tax rate.

Answer (A) is incorrect because A high breakeven point is a sign that the firm is already highly leveraged.
Answer (B) is incorrect because Having a significant percentage of assets under capital lease does not affect the debt vs. equity decision.
Answer (C) is incorrect because Having a low fixed-charge coverage does not affect the debt vs. equity decision.
Answer (D) is correct. The interest paid on indebtedness is deductible for tax purposes; dividends paid to equity holders is not. Thus, a firm with a high effective tax rate would prefer to issue debt, which would create an additional tax benefit.
A company had 150,000 shares outstanding on January 1. On March 1, 75,000 additional shares were issued through a stock dividend. Then on November 1, the company issued 60,000 shares for cash. The number of shares to be used in the denominator of the EPS calculation for the year is

A. 222,500 shares.  
B. 225,000 shares.  
C. 235,000 shares.  
D. 285,000 shares.

- Answer (A) is incorrect because the weighted-average number of shares is 222,500 if the stock dividend is not treated as retroactive. 
- Answer (B) is incorrect because the 225,000 number of shares ignores the November 1 issuance. 
- Answer (C) is correct. The weighted average number of common shares outstanding during the year is the EPS denominator. Shares issued in a stock dividend are assumed to have been outstanding as of the beginning of the earliest accounting period presented. Thus, the 75,000 shares issued on March 1 are deemed to have been outstanding on January 1. The EPS denominator equals 235,000 shares $\{[150,000 \times (12 \text{ months} ÷ 12 \text{ months})] + [75,000 \times (12 \text{ months} ÷ 12 \text{ months})] + [60,000 \times (2 \text{ months} ÷ 12 \text{ months})]\}$. 
- Answer (D) is incorrect because the year-end number of outstanding shares is 285,000.

Everything else being equal, a highly leveraged firm will have earnings per share.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. More</td>
<td>Lower</td>
</tr>
<tr>
<td>B. More</td>
<td>Less volatile</td>
</tr>
<tr>
<td>C. Less</td>
<td>Less volatile</td>
</tr>
<tr>
<td>D. Less</td>
<td>Higher</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because higher leverage is associated with higher, not lower, EPS when sales exceed the breakeven point. 
- Answer (B) is incorrect because earnings per share is more volatile in more highly leveraged firms. 
- Answer (C) is correct. Earnings per share is less volatile in less highly leveraged firms. Lower fixed costs result in less variable earnings when sales fluctuate. 
- Answer (D) is incorrect because less leverage is associated with lower, not higher, EPS when sales exceed the breakeven point.
The equity section of Smith Corporation’s Statement of Financial Position is presented below.

- Preferred stock, $100 par $12,000,000
- Common stock, $5 par 10,000,000
- Paid-in capital in excess of par 18,000,000
- Retained earnings 9,000,000
- Net worth $49,000,000

The book value per share of Smith Corporation’s common stock is

- $18.50
- $5.00
- $14.00
- $100

Answer (A) is correct. The book value per common share equals the net assets (equity) attributable to common shareholders divided by the common shares outstanding, or $18.50 \([(10,000,000 \text{ common stock} + 18,000,000 \text{ additional paid-in capital} + 9,000,000 \text{ RE}) \div (10,000,000 \div 5 \text{ par})]\).

Answer (B) is incorrect because the amount of $5.00 is the par value per share.

Answer (C) is incorrect because the amount of $14.00 fails to include retained earnings in the portion of equity attributable to common shareholders.

Answer (D) is incorrect because the amount of $100 is the par value of a preferred share.

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**Fact Pattern #63**

The Dawson Corporation projects the following for the year:

- Earnings before interest and taxes $35 million
- Interest expense $5 million
- Preferred stock dividends $4 million
- Common stock dividend-payout ratio 30%
- Common shares outstanding 2 million
- Effective corporate income tax rate 40%

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**[493] (Refers to Fact Pattern #63)** The expected common stock dividend per share for Dawson Corporation is

- $2.34
- $2.70
- $1.80
- $2.10

Answer (A) is incorrect because the amount of $2.34 results from treating preferred dividends as tax deductible.

Answer (B) is incorrect because the amount of $2.70 ignores the effect of preferred dividends.

Answer (C) is incorrect because the amount of $1.80 is based on a 60% effective tax rate and ignores the effect of preferred dividends.
Answer (D) is correct. The company’s net income is $18,000,000 \left[ (\$35,000,000 \text{ EBIT} - \$5,000,000 \text{ interest}) \times (1.0 - .4 \text{ tax rate}) \right]. Thus, the earnings available to common shareholders equal $14,000,000 \left( \$18,000,000 - \$4,000,000 \text{ preferred dividends} \right)\), and EPS is $7 \left( \frac{\$14,000,000}{2,000,000 \text{ common shares}} \right). Given a dividend-payout ratio of 30%, the dividend to common shareholders is expected to be $2.10 per share \left( \$7 \times 30\% \right)\).

[494] (Refers to Fact Pattern #63)

If Dawson Corporation’s common stock is expected to trade at a price-earnings ratio of 8, the market price per share (to the nearest dollar) would be

A. $104
B. $56
C. $72
D. $68

Answer (A) is incorrect because The amount of $104 ignores income taxes.

Answer (B) is correct. Net income is $18,000,000 \left[ (\$35,000,000 \text{ EBIT} - \$5,000,000 \text{ interest}) \times (1.0 - .4 \text{ tax rate}) \right], and EPS is $7 \left( \frac{\$18,000,000 - \$4,000,000 \text{ preferred dividends}}{2,000,000 \text{ common shares}} \right). Consequently, the market price is $56 \left( \$7 \text{ EPS} \times 8 \text{ P/E ratio} \right).

Answer (C) is incorrect because The amount of $72 ignores the effect of preferred dividends.

Answer (D) is incorrect because The amount of $68 ignores the deductibility of interest.

[495] In calculating diluted earnings per share when a company has convertible bonds outstanding, the number of common shares outstanding must be <List A> to adjust for the conversion feature of the bonds, and the net income must be <List B> by the amount of interest expense on the bonds, net of tax.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Increased</td>
<td>Increased</td>
</tr>
<tr>
<td>B. Increased</td>
<td>Decreased</td>
</tr>
<tr>
<td>C. Decreased</td>
<td>Increased</td>
</tr>
<tr>
<td>D. Decreased</td>
<td>Decreased</td>
</tr>
</tbody>
</table>

Answer (A) is correct. The weighted-average number of shares outstanding must be increased to reflect the shares into which the bonds could be converted. Also, the effect of the bond interest on net income must be eliminated. In this way, earnings per share is calculated as if the bonds had been converted into common shares as of the start of the year.

Answer (B) is incorrect because The net income must be increased.

Answer (C) is incorrect because The weighted-average number of shares outstanding must be increased.

Answer (D) is incorrect because The weighted-average number of shares outstanding must be increased, and the net income must be increased.
All else being equal, a company with a higher dividend-payout ratio will have a **List A** debt-to-assets ratio and a **List B** current ratio.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Higher</td>
<td>Higher</td>
</tr>
<tr>
<td>B. Higher</td>
<td>Lower</td>
</tr>
<tr>
<td>C. Lower</td>
<td>Higher</td>
</tr>
<tr>
<td>D. Lower</td>
<td>Lower</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because the current ratio will be lower.
- Answer (B) is correct. A company with a higher dividend payout ratio is distributing more of its earnings as dividends to common shareholders. It will have less cash and less total assets than a comparable firm with a lower payout ratio. The debt-to-assets ratio will be higher because total assets are lower, and the current ratio will be lower because cash is lower.
- Answer (C) is incorrect because the debt-to-assets ratio will be higher and the current ratio will be lower.
- Answer (D) is incorrect because the debt-to-assets ratio will be higher.

### Fact Pattern #64
Alberto Corp. has common and preferred shares outstanding with the following characteristics:

<table>
<thead>
<tr>
<th></th>
<th>Common Shares</th>
<th>Preferred Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of shares outstanding</td>
<td>50,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Dividends paid during the year</td>
<td>$100,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Year-end market price per share</td>
<td>$10</td>
<td>$5</td>
</tr>
<tr>
<td>Book value of equity</td>
<td>$500,000</td>
<td>$250,000</td>
</tr>
</tbody>
</table>

For the year just ended, the company had the following statement of income:

- Sales revenue: $1,000,000
- Cost of goods sold: $300,000
- Depreciation expense: $100,000
- Earnings before interest and tax: $600,000
- Interest expense: $100,000
- Earnings before tax: $500,000
- Tax expense: $250,000
- Net income: $250,000

### [497] (Refers to Fact Pattern #64)
Alberto Corp. has earnings per share of

- A. $2.67
- B. $3.33
- C. $4.00
- D. $5.00

- Answer (A) is incorrect because the amount of $2.67 includes all outstanding shares, common and preferred, in the denominator.
- Answer (B) is incorrect because the amount of $3.33 fails to deduct the preferred dividends from the numerator and includes all outstanding shares in the denominator.
Answer (C) is correct. EPS equals the income available for distribution to common shareholders divided by the number of common shares outstanding, or $4.00 \([($250,000 \text{ NI} – $50,000 \text{ preferred dividends}) ÷ 50,000 \text{ common shares}]\). Answer (D) is incorrect because the amount of $5.00 fails to deduct the preferred dividends from the numerator.

### [Fact Pattern #65]
Presented below are partial year-end financial statement data for companies A and B.

<table>
<thead>
<tr>
<th></th>
<th>Company A</th>
<th>Company B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$100</td>
<td>$200</td>
</tr>
<tr>
<td>Accounts Receivable</td>
<td>unknown</td>
<td>100</td>
</tr>
<tr>
<td>Inventories</td>
<td>unknown</td>
<td>100</td>
</tr>
<tr>
<td>Net Fixed Assets</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Accounts Payable</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Long-Term Debt</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>Common Stock</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Retained Earnings</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>Sales</td>
<td>$600</td>
<td>$5,800</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>300</td>
<td>5,000</td>
</tr>
<tr>
<td>Administrative Expenses</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Depreciation Expense</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Interest Expense</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Income Tax Expense</td>
<td>40</td>
<td>95</td>
</tr>
<tr>
<td>Net Income</td>
<td>40</td>
<td>95</td>
</tr>
</tbody>
</table>

If Company A has 60 common shares outstanding, then it has a book value per share, to the nearest cent, of

A. $1.67  
B. $2.50  
C. $4.17  
D. $5.00

- Answer (A) is incorrect because the amount of $1.67 results if retained earnings is omitted from the numerator.  
- Answer (B) is incorrect because the amount of $2.50 results if common stock is omitted from the numerator.  
- Answer (C) is correct. The book value per share for Company A equals the sum of common stock and retained earnings, divided by the number of shares, or $4.17 \([($100 + $150) ÷ 60]\).  
- Answer (D) is incorrect because the amount of $5.00 is the book value per share for Company B.

### [499] (Refers to Fact Pattern #65)
A company has 100,000 outstanding common shares with a market value of $20 per share. Dividends of $2 per share were paid in the current year and the company has a dividend payout ratio of 40%. The price-earnings ratio of the company is

A. 2.5  
B. 4  
C. 10  
D. 50

- Answer (A) is incorrect because EPS divided by dividends per share equals 2.5.  
- Answer (B) is correct. The P/E ratio equals the share price divided by EPS. If the dividends per share equaled $2 and the dividend-payout ratio was 40%, EPS must have been $5 \((5 ÷ .4)\). Accordingly, the P/E ratio is 4 \((20 \text{ share price} ÷ 5 \text{ EPS})\).
Answer (C) is incorrect because Share price divided by dividends per share equals 10.
Answer (D) is incorrect because Price per share divided by the dividend-payout percentage equals 50.

During the most recent fiscal year, Dongata Industries earned net income after tax of $3,288,000. The company paid preferred share dividends of $488,000 and common share dividends of $1,000,000. The current market price of Dongata’s common shares is $56 per share, and the shares are trading at a price-earnings rate of 8. How many common shares does Dongata have outstanding?

A. 350,000  
B. 400,000  
C. 411,000  
D. 469,714

Answer (A) is incorrect because Improperly dividing the income available to common shareholders by the price-earnings ratio (instead of earnings per share) results in 350,000.

Answer (B) is correct. Using known relationships, Dongata’s outstanding common stock can be determined as follows:

\[
\begin{align*}
\text{Price-earnings ratio} &= \frac{\text{Market price}}{\text{Earnings per share}} \\
8 &= \frac{\$56 \text{ per share}}{\text{Earnings per share}} \\
\text{Earnings per share} &= \frac{\$56 \text{ per share}}{8} \\
&= \$7
\end{align*}
\]

\[
\begin{align*}
\text{Net income} &= \$3,288,000 \\
\text{Less: dividends on preferred stock} &= (488,000) \\
\text{Income available to common shareholders} &= \$2,800,000
\end{align*}
\]

\[
\begin{align*}
\text{Earnings per share} &= \frac{\text{Income available to common shareholders}}{\text{Common shares outstanding}} \\
7 &= \frac{\$2,800,000}{\text{Common shares outstanding}} \\
\text{Common shares outstanding} &= \frac{\$2,800,000}{7} \\
&= 400,000
\end{align*}
\]

Answer (C) is incorrect because Improperly dividing net income (instead of income available to common shareholders) by the price-earnings ratio (instead of earnings per share) results in 411,000 shares.

Answer (D) is incorrect because Improperly dividing net income (instead of income available to common shareholders) by earnings per share results in 469,714 shares.

Which one of the following events will most likely result in a higher price-earnings ratio for a company’s common shares?

A. Investors’ required rate of return on the common shares falls.  
B. The rate of growth in dividends is expected to decline.  
C. The economy is expected to enter a recession.  
D. The dividend yield increases when the dividend per share remains unchanged.

Answer (A) is correct. A decrease in investors’ required rate of return will cause share prices to go up, which will result in a higher P/E ratio.

Answer (B) is incorrect because A decline in the rate of dividend growth will cause the share price to decline, which will result in a lower P/E ratio.
Answer (C) is incorrect because it is impossible to determine the impact on the P/E ratio. Earnings may decline and share prices may decline, but the end result cannot be predicted.

Answer (D) is incorrect because an increasing dividend yield indicates that share price must be falling.

Frasier Products has been growing at a rate of 10% per year and expects this growth to continue and produce earnings per share of $4.00 next year. The firm has a dividend payout ratio of 35% and a beta value of 1.25. If the risk-free rate is 7% and the return on the market is 15%, what is the expected current market value of Frasier’s common stock?

A. $14.00  
B. $16.00  
C. $20.00  
D. $28.00

Answer (A) is incorrect because the amount of $14.00 results from failing to add the risk-free rate to the risk premium when calculating the required rate of return.

Answer (B) is incorrect because the amount of $16.00 results from improperly subtracting the risk-free rate from the dividend payout ratio before multiplying the next year’s earnings per share when calculating next year’s projected dividend.

Answer (C) is correct. The first step is to determine the required rate of return on Frasier’s stock. The capital asset pricing model (CAPM) can be used:

\[
\text{Required rate of return} = \text{Risk-free rate} + \beta(\text{Market rate} - \text{Risk-free rate}) \\
= .07 + 1.25(.15 - .07) \\
= .07 + .10 \\
= .17
\]

The second step is to calculate the next dividend.

\[
\text{Next dividend} = \text{Projected EPS} \times \text{Dividend payout ratio} \\
= \$4 \times .35 \\
= \$1.40
\]

Now the dividend growth model can be used to calculate the expected current market value of Frasier’s common stock:

\[
\text{Current market value} = \text{Next dividend} \div (\text{Required rate of return} - \text{Dividend growth rate}) \\
= \$1.40 \div (.17 - .10) \\
= \$1.40 \div .07 \\
= \$20
\]

Answer (D) is incorrect because the amount of $28.00 results from failing to multiply the market risk premium by the beta value when calculating the risk premium.
Bull & Bear Investment Banking is working with the management of Clark, Inc., in order to take the company public in an initial public offering. Selected financial information for Clark is as follows.

<table>
<thead>
<tr>
<th></th>
<th>$10,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt (8% interest rate)</td>
<td></td>
</tr>
<tr>
<td><strong>Common equity:</strong></td>
<td></td>
</tr>
<tr>
<td>Par value ($1 per share)</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Additional paid-in-capital</td>
<td>24,000,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>6,000,000</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td>55,000,000</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>3,750,000</td>
</tr>
<tr>
<td><strong>Dividend (annual)</strong></td>
<td>1,500,000</td>
</tr>
</tbody>
</table>

If public companies in Clark’s industry are trading at twelve times earnings, what is the estimated value per share of Clark?

- **A.** $9.00
- **B.** $12.00
- **C.** $15.00
- **D.** $24.00

- **Answer (A) is incorrect because** The amount of $9.00 results from improperly subtracting the annual dividend from net income.
- **Answer (B) is incorrect because** The amount of $12.00 results from using the par value of the stock rather than earnings per share.
- **Answer (C) is correct.** Clark’s basic earnings per share is $1.25 ($3,750,000 ÷ 3,000,000). Since the industry average is for the stock to trade at 12 times earnings, Clark’s stock price is expected to be $15.00 ($1.25 × 12).
- **Answer (D) is incorrect because** The amount of $24.00 results from dividing retained earnings, rather than net income, by the number of shares.

If public companies in Clark’s industry are trading at a market to book ratio of 1.5, what is the estimated value per share of Clark?

- **A.** $13.50
- **B.** $16.50
- **C.** $21.50
- **D.** $27.50

- **Answer (A) is incorrect because** The amount of $13.50 results from failing to include retained earnings in calculating book value per share.
- **Answer (B) is correct.** A firm’s book value per share consists of total equity divided by the number of common shares outstanding. Clark’s total equity is $33,000,000 ($3,000,000 + $24,000,000 + $6,000,000) and the number of common shares is 3,000,000, making the book value per share $11.00 ($33,000,000 ÷ 3,000,000). Since the industry average market to book ratio is 1.5, Clark’s stock price is expected to be $16.50 ($11.00 × 1.5).
Answer (C) is incorrect because the amount of $21.50 results from improperly including long-term debt in calculating book value per share.

Answer (D) is incorrect because the amount of $27.50 results from using total assets rather than total equity in calculating book value per share.

The Hatch Sausage Company is projecting an annual growth rate for the foreseeable future of 9%. The most recent dividend paid was $3.00 per share. New common stock can be issued at $36 per share. Using the constant growth model, what is the approximate cost of capital for retained earnings?

- A. 9.08%
- B. 17.33%
- C. 18.08%
- D. 19.88%

Answer (A) is incorrect because this percentage is calculated by improperly multiplying the current dividend by the projected growth rate then dividing it by the current issue price per share of common stock.

Answer (B) is incorrect because this percentage results from improperly using the most recent dividend paid.

Answer (C) is correct. The cost of capital can be found using the dividend discount model:

\[
\text{Price of stock} = \frac{\text{Expected dividend per share}}{(\text{Cost of capital} - \text{Dividend growth rate})} \\
= \frac{($3.00 \times 1.09)}{(CC - 9\%)} \\
= $36 \div (CC - 9\%) \\
= $36 \div ($3.24) \\
= $3.24 \div $3.27 \\
= CC = 18.08\%
\]

Answer (D) is incorrect because this percentage overstates the cost of capital.

Vega, Inc., needs to raise $50,000,000 for expansion. The two available options are to sell 7%, 10-year bonds at face value or to sell 5% preferred stock at par for which annual dividends would be paid. Vega’s effective income tax rate is 30%. Which one of the following best describes the difference in Vega’s cash flow for the second year after issue?

- A. Cash flow with the bond issue is $50,000 higher.
- B. Cash flow with the bond issue is $225,000 higher.
- C. Cash flow with the stock issue is $525,000 higher.
- D. Cash flow with the stock issue is $700,000 higher.

Answer (A) is correct. Under the bond issue option, cash flows will consist of interest payments as well as the tax shield effect of debt. Therefore, cash outflows will be $2,450,000 ($50,000,000 \times [0.07 \times (1 - 0.3)])]. Under the preferred stock option, cash flows will consist of payments of dividends, with no tax shield effect. Therefore, cash outflows will be $2,500,000 ($50,000,000 \times 0.05). Therefore, cash flow is $50,000 higher under the bond issue option.

Answer (B) is incorrect because the amount of $225,000 results from finding a rate difference of .45%.

Answer (C) is incorrect because cash flow with the stock issue is not higher than the bond issue.

Answer (D) is incorrect because cash flows do not vary this much between the two options.
An analyst is in the process of determining what the current share price should be for PaperToy, Inc. In early January, the analyst collected the following information on PaperToy, Inc.

- Dividend at end of current year = $1.00
- Yearly dividend increase = 5%
- Expected investor return = 10%

Based on the data provided, the current share price for PaperToy, Inc., should be

A. $21.00
B. $20.00
C. $7.00
D. $6.67

Answer (A) is incorrect because the dividend discount model is a method of arriving at the value of a stock by using expected dividends per share and discounting them back to present value. The formula is as follows:

\[
\text{Dividend per share} \div (\text{Cost of capital} - \text{Dividend growth rate})
\]

The amount of $21.00 incorrectly discounts the $1 dividend to $1.05 (1 × 1.05). This is not necessary because the problem states the dividend at the end of the current year. (NOTE: If given the dividend for the prior year, then this discounting would apply.)

Answer (B) is correct. The dividend discount model is a method of arriving at the value of a stock by using expected dividends per share and discounting them back to present value. The formula is as follows:

\[
\text{Dividend per share} \div (\text{Cost of capital} - \text{Dividend growth rate})
\]

Because the dividend at year end is given, this amount need not be discounted. Therefore, the current share price for PaperToy should be $20 ($1 ÷ .10 – .05).

Answer (C) is incorrect because the dividend discount model is a method of arriving at the value of a stock by using expected dividends per share and discounting them back to present value. The formula is as follows:

\[
\text{Dividend per share} \div (\text{Cost of capital} - \text{Dividend growth rate})
\]

The amount of $7.00 incorrectly discounts the $1 dividend to $1.05 ($1 × 1.05). This is not necessary because the problem states the dividend at the end of the current year. (NOTE: If given the dividend for the prior year, then this discounting would apply.) In addition, this option incorrectly adds the investor return and the dividend growth rate instead of subtracting them from each other.

Answer (D) is incorrect because the dividend discount model is a method of arriving at the value of a stock by using expected dividends per share and discounting them back to present value. The formula is as follows:

\[
\text{Dividend per share} \div (\text{Cost of capital} - \text{Dividend growth rate})
\]

The amount of $6.67 incorrectly adds the investor return and the dividend growth rate instead of subtracting them from each other.

A publicly traded corporation in an industry with an average price-earnings ratio of 20 has the following summary financial results.

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Expenses</td>
<td>500,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$500,000</td>
</tr>
<tr>
<td>Taxes</td>
<td>300,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$200,000</td>
</tr>
<tr>
<td>Assets</td>
<td>$2,500,000</td>
</tr>
<tr>
<td>Liabilities</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Shareholders’ equity</td>
<td>1,500,000</td>
</tr>
</tbody>
</table>

A competitor wishes to make a bid to acquire the stock of the company. What is the current market value?

A. $1,500,000
B. $4,000,000
C. $10,000,000
D. $20,000,000
Answer (A) is incorrect because the shareholders’ equity amount of $1,500,000 is not the same as the current market value of the stock. Shareholders’ equity is carried at book value, not market value, and contains other items of equity besides stock.

Answer (B) is correct. The price-earnings ratio is expressed as the market price per share divided by the earnings per share. However, this can also be expressed as the total market price over the total earnings. Earnings (net income) are equal to $200,000, and the price-earnings ratio is equal to 20. Therefore, the market value can be solved for as follows:

\[
20 = \frac{\text{Market value}}{\$200,000} \\
\text{Market value} = 20 \times \$200,000 \\
= \$4,000,000
\]

Answer (C) is incorrect because the price-earnings ratio is expressed as the market price per share divided by the earnings per share. However, this can also be expressed as the total market price over the total earnings. The amount of $10,000,000 incorrectly uses operating income instead of earnings as the denominator in the ratio to solve for the market value.

Answer (D) is incorrect because the price-earnings ratio is expressed as the market price per share divided by the earnings per share. However, this can also be expressed as the total market price over the total earnings. The amount of $20,000,000 incorrectly uses sales instead of earnings as the denominator in the ratio to solve for the market value.

An automobile company that uses the futures market to set the price of steel to protect a profit against price increases is an example of

A. A short hedge.
B. A long hedge.
C. Selling futures to protect the company from loss.
D. Selling futures to protect against price declines.

Answer (A) is incorrect because a short hedge is a futures contract that is sold to protect against price declines. The automobile company wishes to protect itself against price increases.

Answer (B) is correct. A change in prices can be minimized or avoided by hedging. Hedging is the process of using offsetting commitments to minimize or avoid the impact of adverse price movements. The automobile company desires to stabilize the price of steel so that its cost to the company will not rise and cut into profits. Accordingly, the automobile company uses the futures market to create a long hedge, which is a futures contract that is purchased to protect against price increases.

Answer (C) is incorrect because the automobile company needs to purchase futures in order to protect itself from loss, not sell futures. Selling futures protects against price declines.

Answer (D) is incorrect because it is the definition of a short hedge, which is used for avoiding price declines. The automobile company wants to protect itself against price increases.

A contractual arrangement that gives the owner the right to buy or sell an asset at a fixed price at any moment in time before or on a specified date is an example of

A. European option.
B. Foreign option.
C. Future option.
D. American option.

Answer (A) is incorrect because a European option is exercisable only at the expiration date.
Answer (B) is incorrect because a foreign option is a nonsense term.
Answer (C) is incorrect because although an option can be exercised in the future, it is not called a future option.
Answer (D) is correct. An American option is a contractual arrangement that gives the owner the right to buy or sell an asset at a fixed price at any moment in time before or on a specified date.

Which of the following is exercisable only at the expiration date?

A. Call option.
B. European option.
C. American option.
D. Put option.

Answer (A) is incorrect because a call option may be a European option or an American option.
Answer (B) is correct. An American option is a contractual arrangement that gives the owner the right to buy or sell an asset at a fixed price at any moment in time before or on a specified date. A European option is exercisable only at the expiration date.
Answer (C) is incorrect because an American option is exercisable at any time up to its expiration.
Answer (D) is incorrect because a put option may be a European option or an American option.

The use of derivatives to either hedge or speculate results in

A. Increased risk regardless of motive.
B. Decreased risk regardless of motive.
C. Offsetting risk when hedging and increased risk when speculating.
D. Offsetting risk when speculating and increased risk when hedging.

Answer (A) is incorrect because hedging decreases risk by using offsetting commitments that avoid the impact of adverse price movements.
Answer (B) is incorrect because speculation involves the assumption of risk in the hope of gaining from price movements.
Answer (C) is correct. Derivatives, including options and futures, are contracts between the parties who contract. Unlike stocks and bonds, they are not claims on business assets. A futures contract is entered into as either a speculation or a hedge. Speculation involves the assumption of risk in the hope of gaining from price movements. Hedging is the process of using offsetting commitments to minimize or avoid the impact of adverse price movements.
Answer (D) is incorrect because speculating increases risk while hedging offsets risk.

If a call option is “out of the money,”

A. It is not worth exercising.
B. The value of the underlying asset is less than the exercise price.
C. The option no longer exists.
D. It is not worth exercising, and the value of the underlying asset is less than the exercise price.

Answer (A) is incorrect because although the call option is not worth exercising, the value of the underlying asset is also less than the exercise price.
Answer (B) is incorrect because although the value of the underlying asset is less than the exercise price, it is also not worth exercising.

Answer (C) is incorrect because the option does exist; it is just not worth exercising.

Answer (D) is correct. When the value of the asset underlying a call option is less than the exercise price of the option, the option is “out of the money,” which means it is not worth exercising.

[514] You are currently holding a call option on a stock with an exercise price of $100. If the current stock price is $90, your net proceeds by exercising this option will be

A. $(10)
B. $10
C. $0
D. $90

- **Answer (A) is correct.** If the market price is less than the exercise price, the option is considered to be “out of the money” because the call owner ordinarily would not exercise the option (it would result in a loss). Paying $100 for a $90 stock would result in negative proceeds of $(10).
- **Answer (B) is incorrect because exercising a stock that is “out of the money” results in a loss.**
- **Answer (C) is incorrect because exercising a stock that is “out of the money” results in a loss.**
- **Answer (D) is incorrect because exercising a stock that is “out of the money” results in a loss.**

[515] The type of option that does not have the backing of stock is called a(n)

A. Covered option.
B. Unsecured option.
C. Naked option.
D. Put option.

- **Answer (A) is incorrect because a covered option is one that is written against stock held in the option writer’s portfolio.**
- **Answer (B) is incorrect because an unsecured option is a nonsense term.**
- **Answer (C) is correct.** A naked or uncovered option is a call option that does not have the backing of stock. Thus, the option writer will have to purchase the underlying stock if the call option is exercised.
- **Answer (D) is incorrect because a put option is an option that gives the owner the right to sell the underlying asset for a fixed price.**

[Fact Pattern #67]

AA Company has purchased one ordinary share of QQ Company and one put option. It has also sold one call option. The options are written on one ordinary share of QQ Company and have the same maturity date and exercise price. The exercise price ($40) is the same as the share price. Moreover, the options are exercisable only at the expiration date.
Assume that the value of a share of QQ Company common stock at the expiration date is either $30 or $45. The difference in the net payoff on the portfolio because of a difference in the stock price at the maturity date is

A. $10.00
B. $7.50
C. $5.00
D. $0

- Answer (A) is incorrect because the portfolio has the same value at the maturity date regardless of the price of the stock.
- Answer (B) is incorrect because the portfolio has the same value at the maturity date regardless of the price of the stock.
- Answer (C) is incorrect because the portfolio has the same value at the maturity date regardless of the price of the stock.
- Answer (D) is correct. If the stock price at the maturity date is $30, AA Company will have a share of stock worth $30 and a put option worth $10 ($40 exercise price – $30 stock price). The call option will be worthless. Hence, the net payoff is $40 ($30 + $10). If the stock price at the maturity date is $45, the share of stock will be worth $45, the put will be worthless, and the loss on the call will be $5 ($45 – $40). Thus, the net payoff will be $40 ($45 – $5). Consequently, the difference in the net payoff on the portfolio because of a difference in the stock price at the maturity date is $0 ($40 – $40). The portfolio has the same value at the maturity date regardless of the price of the stock.

Assuming the present value of the exercise price is $36 and the value of the call is $4.50, the value of the put in accordance with the put-call parity theorem is

A. $4.50
B. $4.00
C. $.50
D. $0

- Answer (A) is incorrect because the amount of $4.50 is the value of the call.
- Answer (B) is incorrect because the amount of $4.00 is the difference between the exercise price and its present value.
- Answer (C) is correct. For European options, given market equilibrium for all relevant prices (no arbitrage possibilities), equal exercise prices for the put and the call, and the same expiration date, the put-call parity theorem states that a fixed relationship applies to the market values of the put and call options on a security. For example, a strategy of selling one call option, buying one share of the stock, and buying one put option should result in a risk-free return. The gain (loss) from the stock and the put should equal the gain (loss) on the call. If $V_S$ is the value of the stock, $V_P$ is the value of the put, $V_C$ is the value of the call, and $PV_E$ is the present value of the exercise price (the time interval is the time to expiration), the formula for put-call parity may be stated as follows:

$$PV_E = V_P + V_S - V_C$$

Accordingly, the value of the put is $.50 ($36 + $4.50 – $40).
- Answer (D) is incorrect because the put has a value of $.50.
How much must the stock be worth at expiration in order for a call holder to break even if the exercise price is $60 and the call premium was $3?

A. $57.00  
B. $60.00  
C. $61.50  
D. $63.00

- Answer (A) is incorrect because the amount of $57 is the result of deducting the call premium from the exercise price.
- Answer (B) is incorrect because the amount of $60 is the result of failing to consider the impact of the call premium.
- Answer (C) is incorrect because the full call premium must be added to the exercise price.
- Answer (D) is correct. Because the call premium is $3, the stock price must be at least $63 ($60 exercise price + $3 call premium).

If $V_P$ is the value of a put option, $V_C$ is the value of a call option, $V_S$ is the value of the stock, and $PV_E$ is the present value of the exercise price, what is the formula for the put-call parity theorem for European options?

A. $V_S = PV_E - V_P - V_C$  
B. $V_S + V_P - V_C = PV_E$  
C. $V_S + PV_E = V_P + V_C$  
D. $PV_E = V_S - V_P - V_C$

- Answer (A) is incorrect because the formula is $V_S + V_P - V_C = PV_E$.
- Answer (B) is correct. For European options, given market equilibrium for all relevant prices (no arbitrage possibilities), equal exercise prices for the put and the call, and the same expiration date, the put-call parity theorem states that a fixed relationship applies to the market values of the put and call options on a security. For example, a strategy of selling one call option, buying one share of the stock, and buying one put option should result in a risk-free return. The gain (loss) from the stock and the put should equal the gain (loss) on the call. If $V_S$ is the value of the stock, $V_P$ is the value of the put, $V_C$ is the value of the call, and $PV_E$ is the present value of the exercise price (the time interval is the time to expiration), the formula for put-call parity may be stated as follows: $V_S + V_P - V_C = PV_E$.
- Answer (C) is incorrect because the formula is $V_S + V_P - V_C = PV_E$.
- Answer (D) is incorrect because the formula is $V_S + V_P - V_C = PV_E$.

Which one of the following is not a determinant in valuing a call option?

A. Exercise price.  
B. Expiration date.  
C. Forward contract price.  
D. Interest rate.

- Answer (A) is incorrect because exercise price is one of the determinants on which the value of a call option is based.
- Answer (B) is incorrect because the call option’s expiration date is used in determining the call option’s value.
- Answer (C) is correct. The exercise price, the expiration date, and the interest rate are all determinants in valuing a call option.
- Answer (D) is incorrect because the risk-free interest rate is one of the determinants of the value of a call option.
A forward contract involves a commitment today to purchase a product on a specific future date at a price to be determined some time in the future.

A. On a specific future date at a price to be determined some time in the future.
B. At some time during the current day at its present price.
C. On a specific future date at a price determined today.
D. Only when its price increases above its current exercise price.

- Answer (A) is incorrect because the price of a future contract is determined on the day of commitment, not some time in the future.
- Answer (B) is incorrect because performance is deferred in a future contract, and the price of the product is not necessarily its present price. The price can be any price determined on the day of commitment.
- Answer (C) is correct. A forward contract is an executory contract in which the parties involved agree to the terms of a purchase and a sale, but performance is deferred. Accordingly, a forward contract involves a commitment today to purchase a product on a specific future date at a price determined today.
- Answer (D) is incorrect because a forward contract is a firm commitment to purchase a product. It is not based on a contingency. Also, a forward contract does not involve an exercise price (exercise price is in an option contract).

If a corporation holds a forward contract for the delivery of U.S. Treasury bonds in 6 months and, during those 6 months, interest rates decline, at the end of the 6 months the value of the forward contract will have

A. Decreased.
B. Increased.
C. Remained constant.
D. Any of the answers may be correct, depending on the extent of the decline in interest rates.

- Answer (A) is incorrect because the value of the forward contract will increase when interest rates decrease.
- Answer (B) is correct. Interest rate futures contracts involve risk-free bonds, such as U.S. Treasury bonds. When interest rates decrease over the period of a forward contract, the value of the bonds and the forward contract increase.
- Answer (C) is incorrect because the value of the forward contract will increase when interest rates decrease.
- Answer (D) is incorrect because any decline in interest rates increases the value of the bonds.

A company has recently purchased some stock of a competitor as part of a long-term plan to acquire the competitor. However, it is somewhat concerned that the market price of this stock could decrease over the short run. The company could hedge against the possible decline in the stock’s market price by

A. Purchasing a call option on that stock.
B. Purchasing a put option on that stock.
C. Selling a put option on that stock.
D. Obtaining a warrant option on that stock.

- Answer (A) is incorrect because a call option is the right to purchase shares at a given price within a specified period.
- Answer (B) is correct. A put option is the right to sell stock at a given price within a certain period. If the market price falls, the put option may allow the sale of stock at a price above market, and the profit of the option holder will be the difference between the price stated in the put option and the market price, minus the cost of the option, commissions, and taxes. The company that issues the stock has nothing to do with put (and call) options.
- Answer (C) is incorrect because selling a put option could force the company to purchase additional stock if the option is exercised.
- Answer (D) is incorrect because a warrant gives the holder a right to purchase stock from the issuer at a given price (it is usually distributed along with debt).

[524] When a firm finances each asset with a financial instrument of the same approximate maturity as the life of the asset, it is applying

A. Working capital management.
B. Return maximization.
C. Financial leverage.
D. A hedging approach.

- Answer (A) is incorrect because working capital management is short-term asset management.
- Answer (B) is incorrect because return maximization is more aggressive than maturity matching. It entails using the lowest cost forms of financing.
- Answer (C) is incorrect because financial leverage is the relationship between debt and equity financing.
- Answer (D) is correct. Maturity matching, or equalizing the life of an asset and the debt instrument used to finance that asset, is a hedging approach. The basic concept is that the company has the entire life of the asset to recover the amount invested before having to pay the lender.

[525] A distinguishing feature of a futures contract is that

A. Performance is delayed.
B. It is a hedge, not a speculation.
C. Delivery is to be on a specific day.
D. The price is marked to market each day.

- Answer (A) is incorrect because both a forward contract and a futures contract are executory.
- Answer (B) is incorrect because a futures contract may be speculative.
- Answer (C) is incorrect because a futures contract is for delivery during a given month.
- Answer (D) is correct. A distinguishing feature of futures contracts is that their prices are marked to market every day at the close of the day. Thus, the market price is posted at the close of business each day. A mark-to-market provision minimizes a futures contract’s chance of default because profits and losses on the contracts must be received or paid each day through a clearinghouse.

[526] Buying a wheat futures contract to protect against price fluctuation of wheat would be classified as a

A. Fair value hedge.
B. Cash flow hedge.
C. Foreign currency hedge.
D. Swap.

- Answer (A) is incorrect because a fair value hedge is an instrument designed as hedging the exposure to changes in fair value of an asset or liability or an identified portion thereof that is attributed to a particular risk.
Answer (B) is correct. A cash flow hedge is an instrument designated as hedging the exposure to variability in expected future cash flows attributed to a particular risk.

Answer (C) is incorrect because A foreign currency hedge is an instrument designated as hedging the exposure to variability in foreign currency.

Answer (D) is incorrect because A swap is a contract between two parties in which the parties promise to make payments to one another on scheduled dates in the future and use different criteria or formulas to determine their respective payments.

[527] The owner of a call option wants to know the respective effects on the call’s price of a decrease in stock-return volatility and a decrease in time to expiration. The respective effects on the call’s price are which of the following?

<table>
<thead>
<tr>
<th>Decrease in Stock-Return Volatility</th>
<th>Decrease in Time to Expiration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>B. Decrease</td>
<td>Increase</td>
</tr>
<tr>
<td>C. Increase</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. Increase</td>
<td>Increase</td>
</tr>
</tbody>
</table>

- Answer (A) is correct. A decrease in stock-return volatility will cause the call’s price to decrease. A decrease in the time to expiration will also cause the call’s price to decrease. Thus, both of these effects will cause a decrease in the call’s price.
- Answer (B) is incorrect because A decrease in time to expiration will cause the call’s price to decrease, not increase.
- Answer (C) is incorrect because A decrease in stock-return volatility will cause the call’s price to decrease, not increase.
- Answer (D) is incorrect because Both a decrease in stock-return volatility and a decrease in time to expiration will cause the call’s price to decrease, not increase.

[528] A major use of warrants in financing is to

A. Lower the cost of debt.
B. Avoid dilution of earnings per share.
C. Maintain managerial control.
D. Permit the buy-back of bonds before maturity.

- Answer (A) is correct. Warrants are long-term options that give holders the right to buy common stock in the future at a specific price. If the market price goes up, the holders of warrants will exercise their rights to buy stock at the special price. If the market price does not exceed the exercise price, the warrants will lapse. Issuers of debt sometimes attach stock purchase warrants to debt instruments as an inducement to investors. The investor then has the security of fixed-return debt plus the possibility for large gains if stock prices increase significantly. If warrants are attached, debt can sell at an interest rate slightly lower than the market rate.
- Answer (B) is incorrect because Outstanding warrants dilute earnings per share. They are included in the denominator of the EPS calculation even if they have not been exercised.
- Answer (C) is incorrect because Warrants can, if exercised, result in a dilution of management’s holdings.
- Answer (D) is incorrect because A call provision in a bond indenture, not the use of warrants, permits the buyback of bonds.
Maloney, Inc.’s $1,000 par value preferred stock paid its $100 per share annual dividend on April 4 of the current year. The preferred stock’s current market price is $960 a share on the date of the dividend distribution. Maloney’s marginal tax rate (combined federal and state) is 40%, and the firm plans to maintain its current capital structure relationship. The component cost of preferred stock to Maloney would be closest to

A. 6%
B. 6.25%
C. 10%
D. 10.4%

- Answer (A) is incorrect because there is no tax deductibility of preferred dividends and the denominator is the current market price, not the par value.
- Answer (B) is incorrect because there is no tax deductibility of preferred dividends.
- Answer (C) is incorrect because the denominator is the current market price, not the par value.
- Answer (D) is correct. The component cost of preferred stock is equal to the dividend yield, i.e., the cash dividend divided by the market price of the stock. (Dividends on preferred stock are not deductible for tax purposes; therefore, there is no adjustment for tax savings.) The annual dividend on preferred stock is $100 when the price of the stock is $960. This results in a cost of capital of about 10.4% ($100 ÷ $960).

The theory underlying the cost of capital is primarily concerned with the cost of

A. Long-term funds and old funds.
B. Short-term funds and new funds.
C. Long-term funds and new funds.
D. Short-term funds and old funds.

- Answer (A) is incorrect because the concern is with the cost of new funds; the cost of old funds is a sunk cost and of no relevance for decision-making purposes.
- Answer (B) is incorrect because the cost of short-term funds is not usually a concern for investment purposes.
- Answer (C) is correct. The theory underlying the cost of capital is based primarily on the cost of long-term funds and the acquisition of new funds. The reason is that long-term funds are used to finance long-term investments. For an investment alternative to be viable, the return on the investment must be greater than the cost of the funds used. The objective in short-term borrowing is different. Short-term loans are used to meet working capital needs and not to finance long-term investments.
- Answer (D) is incorrect because the cost of old funds is a sunk cost and of no relevance for decision-making purposes. Similarly, short-term funds are used for working capital or other temporary purposes, and there is less concern with the cost of capital and the way it compares with the return earned on the assets borrowed.

Osgood Products has announced that it plans to finance future investments so that the firm will achieve an optimum capital structure. Which one of the following corporate objectives is consistent with this announcement?

A. Maximize earnings per share.
B. Minimize the cost of debt.
C. Maximize the net worth of the firm.
D. Minimize the cost of equity.

- Answer (A) is incorrect because the maximization of EPS may not always suggest the best capital structure.
Answer (B) is incorrect because The minimization of debt cost may not be optimal; as long as the firm can earn more on debt capital than it pays in interest, debt financing may be indicated.

Answer (C) is correct. Financial structure is the composition of the financing sources of the assets of a firm. Traditionally, the financial structure consists of current liabilities, long-term debt, retained earnings, and stock. For most firms, the optimum structure includes a combination of debt and equity. Debt is cheaper than equity, but excessive use of debt increases the firm’s risk and drives up the weighted-average cost of capital.

Answer (D) is incorrect because Minimizing the cost of equity may signify overly conservative management.

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[Fact Pattern #68]

In referring to the graph of a firm’s cost of capital, if e is the optimal position, which one of the following statements best explains the saucer or U-shaped curve?

A. The composition of debt and equity does not affect the firm’s cost of capital.

B. The cost of capital is almost always favorably influenced by increases in financial leverage.

C. The cost of capital is almost always negatively influenced by increases in financial leverage.

D. Use of at least some debt financing will enhance the value of the firm.

Answer (A) is incorrect because The composition of the capital structure affects the cost of capital since the components have different costs.

Answer (B) is incorrect because The cost of debt does not remain constant as financial leverage increases. Eventually, that cost also increases.

Answer (C) is incorrect because Increased leverage is initially favorable.

Answer (D) is correct. The U-shaped curve indicates that the cost of capital is quite high when the debt-to-equity ratio is quite low. As debt increases, the cost of capital declines as long as the cost of debt is less than that of equity. Eventually, the decline in the cost of capital levels off because the cost of debt ultimately rises as more debt is used. Additional increases in debt (relative to equity) will then increase the cost of capital. The implication is that some debt is present in the optimal capital structure because the cost of capital initially declines when debt is added. However, a point is reached (e) at which debt becomes excessive and the cost of capital begins to rise.
When calculating the cost of capital, the cost assigned to retained earnings should be

A. Zero.
B. Lower than the cost of external common equity.
C. Equal to the cost of external common equity.
D. Higher than the cost of external common equity.

- Answer (A) is incorrect because the cost of retained earnings is the rate of return shareholders require on equity capital the firm obtains by retaining earnings. The opportunity cost of retained funds will be positive.
- Answer (B) is incorrect. Newly issued or external common equity is more costly than retained earnings. The company incurs issuance costs when raising new, outside funds.
- Answer (C) is incorrect because retained earnings will always be less costly than external equity financing. Earnings retention does not require the payment of issuance costs.
- Answer (D) is incorrect because retained earnings will always be less costly than external equity financing. Earnings retention does not require the payment of issuance costs.

Global Company Press has $150 par value preferred stock with a market price of $120 a share. The organization pays a $15 per share annual dividend. Global’s current marginal tax rate is 40%. Looking to the future, the company anticipates maintaining its current capital structure. What is the component cost of preferred stock to Global?

A. 6%
B. 7.5%
C. 10%
D. 12.5%

- Answer (A) is incorrect because the preferred stock dividend is not deductible for tax purposes and the denominator is the market price, not the par value.
- Answer (B) is incorrect because the preferred stock dividend is not deductible for tax purposes.
- Answer (C) is incorrect because the denominator is the market price, not the par value.
- Answer (D) is correct. The component cost of preferred stock is the dividend divided by the market price (also called the dividend yield). No tax adjustment is necessary because dividends are not deductible. Since the market price is $120 when the dividend is $15, the component cost of preferred capital is 12.5% ($15 ÷ $120).

Which one of the following factors might cause a firm to increase the debt in its financial structure?

A. An increase in the corporate income tax rate.
B. Increased economic uncertainty.
C. An increase in the federal funds rate.
D. An increase in the price-earnings ratio.

- Answer (A) is correct. An increase in the corporate income tax rate might encourage a company to borrow because interest on debt is tax deductible, whereas dividends are not. Accordingly, an increase in the tax rate means that the after-tax cost of debt capital will decrease. Given equal interest rates, a firm with a high tax rate will have a lower after-tax cost of debt capital than a firm with a low tax rate.
- Answer (B) is incorrect because increased uncertainty encourages equity financing. Dividends do not have to be paid in bad years, but interest on debt is a fixed charge.
- Answer (C) is incorrect because an increase in interest rates discourages debt financing.
Answer (D) is incorrect because an increase in the price-earnings ratio means that the return to shareholders (equity investors) is declining; therefore, equity capital is a more attractive financing alternative.

[536] What is the weighted average cost of capital for a firm using 65% common equity with a return of 15%, 25% debt with a return of 6%, 10% preferred stock with a return of 10%, and a tax rate of 35%?

A. 10.333%  
B. 11.275%  
C. 11.725%  
D. 12.250%

- Answer (A) is incorrect because this percentage is an unweighted average of the three costs, and also ignores the tax shield.
- Answer (B) is incorrect because using the complement of the tax rate instead of the tax rate to calculate the tax shield results in 11.275%.
- Answer (C) is correct. The cost for equity capital is given as 15%, and preferred stock is 10%. The before-tax rate for debt is given as 6%, which translates to an after-tax cost of 3.9% \( [6\% \times (1.0 - .35)] \). The rates are weighted as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Cost</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>25%</td>
<td>3.9%</td>
<td>.975%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>10%</td>
<td>10.0%</td>
<td>1.000%</td>
</tr>
<tr>
<td>Common stock</td>
<td>65%</td>
<td>15.0%</td>
<td>9.750%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>11.725%</strong></td>
</tr>
</tbody>
</table>

- Answer (D) is incorrect because this percentage ignores the tax savings on debt capital.

[537] What is the after-tax cost of preferred stock that sells for $5 per share and offers a $0.75 dividend when the tax rate is 35%?

A. 5.25%  
B. 9.75%  
C. 10.50%  
D. 15%

- Answer (A) is incorrect because using the complement of the tax rate to reduce the effective cost results in 5.25%.
- Answer (B) is incorrect because this percentage reduces the cost by the tax rate, which is not appropriate since preferred dividends are not deductible for tax purposes.
- Answer (C) is incorrect because this percentage assumes a 30% tax rate and deductibility of dividends.
- Answer (D) is correct. The component cost of preferred stock is the dividend yield, i.e., the cash dividend divided by the market price of the stock \( \frac{$.75}{$5.00} = 15\% \). Preferred dividends are not deductible for tax purposes.
What is the weighted average cost of capital for a firm with equal amounts of debt and equity financing, a 15% before-tax company cost of equity capital, a 35% tax rate, and a 12% coupon rate on its debt that is selling at par value?

A. 8.775%  
B. 9.60%  
C. 11.40%  
D. 13.50%

- Answer (A) is incorrect because this percentage assumes that dividends on equity capital are tax deductible.
- Answer (B) is incorrect because using the complement of the tax rate instead of the tax rate results in 9.60%.
- Answer (C) is **correct**. The 12% debt coupon rate is reduced by the 35% tax shield, resulting in a cost of debt of 7.8% \([12\% \times (1.0 - .35)]\). The average of the 15% equity capital and 7.8% debt is 11.4%.
- Answer (D) is incorrect because this percentage overlooks the tax shield on the debt capital.

What is the weighted average cost of capital for a firm with 40% long-term debt, 20% preferred stock, and 40% common equity if the respective before-tax costs for these components are 8%, 13%, and 17%? The firm’s tax rate is 35%.

A. 10.22%  
B. 10.52%  
C. 12.60%  
D. 11.48%

- Answer (A) is incorrect because this percentage assumes that dividends on common equity (instead of debt) are tax deductible, which is incorrect.
- Answer (B) is incorrect because using the complement of the tax rate, and assuming the debt rate was before tax rather than after tax results in 10.52%.
- Answer (C) is incorrect because this percentage results from failing to take the tax effect of debt into account.
- Answer (D) is **correct**. The firm calculates its WACC as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Cost</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>40%</td>
<td>8% × (1.0 - .35)</td>
<td>2.08%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>20%</td>
<td>13%</td>
<td>2.60%</td>
</tr>
<tr>
<td>Common stock</td>
<td>40%</td>
<td>17%</td>
<td>6.80%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>11.48%</strong></td>
</tr>
</tbody>
</table>

If \( k \) is the cost of debt and \( t \) is the marginal tax rate, the after-tax cost of debt, \( k_c \), is best represented by the formula

A. \( k_c = k + t \)  
B. \( k_c = k \div (1 - t) \)  
C. \( k_c = k(t) \)  
D. \( k_c = k(1 - t) \)

- Answer (A) is incorrect because the after-tax cost of debt is the cost of debt times the quantity one minus the tax rate.
- Answer (B) is incorrect because the after-tax cost of debt is the cost of debt times the quantity one minus the tax rate.
Answer (C) is incorrect because the cost of debt times the marginal tax rate equals the tax savings from issuing debt.

Answer (D) is correct. The after-tax cost of debt is the cost of debt times the quantity one minus the tax rate. For example, the after-tax cost of a 10% bond is 7% \([10\% \times (1 - 30\%)]\) if the tax rate is 30%.

Hi-Tech, Inc., has determined that it can minimize its weighted average cost of capital (WACC) by using a debt-equity ratio of 2/3. If the firm’s cost of debt is 9% before taxes, the cost of equity is estimated to be 12% before taxes, and the tax rate is 40%, what is the firm’s WACC?

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Cost</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt</td>
<td>40%</td>
<td>5.4%</td>
<td>2.16%</td>
</tr>
<tr>
<td>Equity</td>
<td>60%</td>
<td>12.0%</td>
<td>7.20%</td>
</tr>
</tbody>
</table>

\[WACC = \left(\frac{2}{3} \times 12\%\right) + \left(\frac{1}{3} \times [(9\% \times (1 - 0.4))]\right)\]

Answer (A) is incorrect because improperly subtracting the effect of taxes from the cost of equity results in 6.48%.

Answer (B) is incorrect because improperly subtracting the effect of taxes from equity, but not from debt, results in 7.92%.

Answer (C) is correct. A firm’s weighted-average cost of capital (WACC) is derived by weighting the (after-tax) cost of each component of the financing structure by its proportion of the financing structure as a whole. Hi-Tech’s WACC can be calculated as follows:

Answer (D) is incorrect because improperly using the before-tax cost of debt results in 10.80%.

A firm’s target or optimal capital structure is consistent with which one of the following?

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Maximum earnings per share.</td>
<td></td>
</tr>
<tr>
<td>B. Minimum cost of debt.</td>
<td></td>
</tr>
<tr>
<td>C. Minimum risk.</td>
<td></td>
</tr>
<tr>
<td>D. Minimum weighted-average cost of capital.</td>
<td></td>
</tr>
</tbody>
</table>

Answer (A) is incorrect because EPS is based on the relationship between costs and revenues, whereas the capital structure is related only to the cost of capital.

Answer (B) is incorrect because the cost of equity capital must also be considered when optimizing capital structure.

Answer (C) is incorrect because the minimum risk may be associated with high costs.

Answer (D) is correct. Ideally, a firm will have a capital structure that minimizes its weighted-average cost of capital. This requires a balancing of both debt and equity capital and their associated risk levels.
A company has the following financial information:

<table>
<thead>
<tr>
<th>Source of capital</th>
<th>Proportion of capital structure</th>
<th>Cost of capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>60%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>20%</td>
<td>10.5%</td>
</tr>
<tr>
<td>Common stock</td>
<td>20%</td>
<td>14.2%</td>
</tr>
</tbody>
</table>

To maximize shareholder wealth, the company should accept projects with returns greater than what percent?

A. 7.1%  
B. 9.2%  
C. 10.6%  
D. 14.2%

- Answer (A) is incorrect because the threshold for accepting projects should be the weighted-average cost of all sources of capital, not just debt.
- Answer (B) is correct. The company should not accept projects that have a lower return than the after-tax weighted-average cost of capital, calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Weight</th>
<th>Cost of Capital</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>60%</td>
<td>7.1%</td>
<td>4.26%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>20%</td>
<td>10.5%</td>
<td>2.10%</td>
</tr>
<tr>
<td>Common equity</td>
<td>20%</td>
<td>14.2%</td>
<td>2.84%</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td></td>
<td>9.20%</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because the WACC is determined by multiplying the cost of each component of capital by its proportion, not by taking their average.
- Answer (D) is incorrect because the threshold for accepting projects should be the weighted-average cost of all sources of capital, not just common stock.

ABC Co. had debt with a market value of $1 million and an after-tax cost of financing of 8%. ABC also had equity with a market value of $2 million and a cost of equity capital of 9%. ABC’s weighted-average cost of capital would be

A. 8.0%  
B. 8.5%  
C. 8.7%  
D. 9.0%

- Answer (A) is incorrect because the cost of debt financing only is 8.0%.
- Answer (B) is incorrect because simply averaging the unweighted costs of debt and equity results in 8.5%.
Answer (C) is **correct**. ABC’s cost of capital can be calculated as follows:

<table>
<thead>
<tr>
<th>Market Value</th>
<th>Weight</th>
<th>Component Cost</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt</td>
<td>$1,000,000</td>
<td>33.33% × 8%</td>
<td>2.67%</td>
</tr>
<tr>
<td>Equity</td>
<td>2,000,000</td>
<td>66.67% × 9%</td>
<td>6.00%</td>
</tr>
<tr>
<td>Totals</td>
<td>$3,000,000</td>
<td>100.00%</td>
<td>8.67%</td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because **the cost of equity financing only is 9.0%**.

[545] A company with a combined federal and state tax rate of 30% has the following capital structure:

<table>
<thead>
<tr>
<th>Weight</th>
<th>Instrument</th>
<th>Cost of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>Bonds</td>
<td>10%</td>
</tr>
<tr>
<td>50%</td>
<td>Common stock</td>
<td>10%</td>
</tr>
<tr>
<td>10%</td>
<td>Preferred stock</td>
<td>20%</td>
</tr>
</tbody>
</table>

What is the weighted-average after-tax cost of capital for this company?

A. 3.3%  
B. 7.7%  
C. 8.2%  
D. 9.8%

- Answer (A) is incorrect because **to calculate the after-tax cost of capital, the component should be multiplied by 1 minus the tax rate, not the tax rate itself. Additionally, there is no tax savings associated with common and preferred stock.**
- Answer (B) is incorrect because **there is no tax savings associated with common stock and preferred stock.**
- Answer (C) is incorrect because **to calculate the after-tax cost of capital, the component should be multiplied by 1 minus the tax rate, not the tax rate itself.**
- Answer (D) is **correct**. The company’s weighted-average cost of capital can be calculated as follows:

<table>
<thead>
<tr>
<th>Weight</th>
<th>Cost of Capital</th>
<th>Tax Effect</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonds</td>
<td>40% × 10% × 70% =</td>
<td>2.8%</td>
<td></td>
</tr>
<tr>
<td>Common equity</td>
<td>50% × 10% ×</td>
<td>5.0%</td>
<td></td>
</tr>
<tr>
<td>Preferred stock</td>
<td>10% × 20% ×</td>
<td>2.0%</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>9.8%</td>
<td></td>
</tr>
</tbody>
</table>

[546] What return on equity do investors seem to expect for a firm with a $50 share price, an expected dividend of $5.50, a β of .9, and a constant growth rate of 4.5%?

A. 15.05%  
B. 15.50%  
C. 15.95%  
D. 16.72%
• Answer (A) is incorrect because This percentage adjusted the growth rate by the $\beta$, which is not required.

• Answer (B) is correct. Dividing the $5.50$ dividend by the $50$ share price produces an $11\%$ dividend yield. Adding the $11\%$ yield to the $4.5\%$ growth rate produces a total return of $15.5\%$. The beta coefficient is irrelevant.

• Answer (C) is incorrect because This percentage adjusted the growth rate upward by the $\beta$.

• Answer (D) is incorrect because This percentage adjusted the share price by the $\beta$.

[547] In calculating the component costs of long-term funds, the appropriate cost of retained earnings, ignoring flotation costs, is equal to

A. The cost of common stock.
B. The same as the cost of preferred stock.
C. The weighted average cost of capital for the firm.
D. Zero, or no cost.

• Answer (A) is correct. Common shareholders expect retained earnings to be paid out in the form of dividends. Thus, the cost of retained earnings is an opportunity cost, i.e., the rate that investors can earn elsewhere on investments of comparable risk.

• Answer (B) is incorrect because The cost of preferred stock is based on its stated dividend rate, regardless of the amount of retained earnings available.

• Answer (C) is incorrect because The weighted-average cost of capital is an average of all sources of long-term funds.

• Answer (D) is incorrect because All sources of funds have a cost to the corporation.

[548] Which of the following, when considered individually, would generally have the effect of increasing a firm’s cost of capital?

I. The firm reduces its operating leverage.
II. The corporate tax rate is increased.
III. The firm pays off its only outstanding debt.
IV. The Treasury Bond yield increases.

A. I and III.
B. II and IV.
C. III and IV.
D. I, III and IV.

• Answer (A) is incorrect because Reducing operating leverage means reducing the amount of fixed costs used in the organization’s production process; this would make the firm less risky and therefore lower the cost of capital.

• Answer (B) is incorrect because Interest is paid before the calculation of taxes but dividends are paid from after-tax income; a rise in the corporate tax rate thus would lower the firm’s cost of capital because the firm would receive a higher tax shield.

• Answer (C) is correct. Debt generally has a lower initial cost than equity. By removing debt from the firm’s financing structure, the cost of capital is thereby increased. Similarly, the increase in yield on Treasury bonds, a risk-free rate, would cause the yield on all other bonds to also increase.

• Answer (D) is incorrect because Reducing operating leverage means reducing the amount of fixed costs used in the organization’s production process would lower the cost of capital.
Angela Company’s capital structure consists entirely of long-term debt and common equity. The cost of capital for each component is shown below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>8%</td>
</tr>
<tr>
<td>Common equity</td>
<td>15%</td>
</tr>
</tbody>
</table>

Angela pays taxes at a rate of 40%. If Angela’s weighted average cost of capital is 10.41%, what proportion of the company’s capital structure is in the form of long-term debt?

A. 34%
B. 45%
C. 55%
D. 66%

- Answer (A) is incorrect because this percentage results from simply dividing the 8% cost of debt by the 15% cost of common stock.
- Answer (B) is correct. The effective rate for Angela’s debt is the after-tax cost \(8\% \times (1.0 - 0.40 \text{ tax rate}) = 4.8\%\).

The formula for weighted-average cost of capital can be solved as follows:

\[
\text{(Debt weight} \times \text{ Cost of debt}) + (\text{Equity weight} \times \text{ Cost of equity}) = \text{WACC}
\]

\[
\text{(Debt weight} \times 0.048) + (\text{Equity weight} \times 0.15) = 0.1041
\]

\[
(1 - \text{Equity weight}) \times 0.048 + (\text{Equity weight} \times 0.15) = 0.1041
\]

\[
0.048 - (0.048 \times \text{Equity weight}) + (\text{Equity weight} \times 0.15) = 0.0561
\]

\[
\text{Equity weight} \times 0.102 = 0.0561
\]

\[
\text{Equity weight} = 0.55
\]

Since equity is 55% of the capital structure, debt makes up 45%.

- Answer (C) is incorrect because this percentage is the proportion of WACC in the form of common equity.
- Answer (D) is incorrect because this percentage results from improperly subtracting the percentage of common equity rather than the tax rate \(8\% \times (1.0 - 0.15) = 6.8\%\) and \(6.8 \div 10.41) = 65.32\%\).

An accountant for Stability, Inc., must calculate the weighted average cost of capital of the corporation using the following information.

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$35,000,000</td>
</tr>
<tr>
<td>Long-term debt</td>
<td>$10,000,000</td>
</tr>
<tr>
<td>Common stock</td>
<td>$10,000,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>$5,000,000</td>
</tr>
</tbody>
</table>

What is the weighted average cost of capital of Stability?

A. 6.88%
B. 8.00%
C. 10.25%
D. 12.80%

- Answer (A) is incorrect because this percentage results from improperly ignoring the weighted cost of common stock.
Answer (B) is incorrect because this percentage is the component cost of debt.
Answer (C) is incorrect because this percentage results from improperly performing a simple average on the four balance sheet items listed.
Answer (D) is correct. Since the effect of income taxes is ignored in this situation, the stated rate on Stability’s long-term debt is considered to be its effective rate. The weighted-average cost of capital (WACC) can thus be calculated as follows:

<table>
<thead>
<tr>
<th>Carrying Amount</th>
<th>Weight</th>
<th>Cost of Capital</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>$10,000,000</td>
<td>40% × 8%</td>
<td>3.2%</td>
</tr>
<tr>
<td>Common stock</td>
<td>10,000,000</td>
<td>40% × 15%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>5,000,000</td>
<td>20% × 18%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Totals</td>
<td>$25,000,000</td>
<td>100%</td>
<td>12.8%</td>
</tr>
</tbody>
</table>

Kielly Machines, Inc., is planning an expansion program estimated to cost $100 million. Kielly is going to raise funds according to its target capital structure shown below:

Debt .30  
Preferred stock .24  
Equity .46

Kielly had net income available to common shareholders of $184 million last year of which 75% was paid out in dividends. The company has a marginal tax rate of 40%.

Additional data:
- The before-tax cost of debt is estimated to be 11%.
- The market yield of preferred stock is estimated to be 12%.
- The after-tax cost of common stock is estimated to be 16%.

What is Kielly’s weighted average cost of capital?

A. 12.22%  
B. 13.00%  
C. 13.54%  
D. 14.00%

Answer (A) is correct. The effective rate for Kielly’s debt is the after-tax cost [11% × (1.0 – .40 tax rate) = 6.6%]
The weighted average cost of capital (WACC) can thus be calculated as follows:

<table>
<thead>
<tr>
<th>Carrying Amount</th>
<th>Weight</th>
<th>Cost of Capital</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt $ 30,000,000</td>
<td>30% × 6.6%</td>
<td>1.98%</td>
<td></td>
</tr>
<tr>
<td>Preferred stock 24,000,000</td>
<td>24% × 12.0%</td>
<td>2.88%</td>
<td></td>
</tr>
<tr>
<td>Common equity 46,000,000</td>
<td>46% × 16.0%</td>
<td>7.36%</td>
<td></td>
</tr>
<tr>
<td>Totals $100,000,000</td>
<td>100%</td>
<td>12.22%</td>
<td></td>
</tr>
</tbody>
</table>

Answer (B) is incorrect because this percentage results from performing a simple average cost calculation on the individual components of capital.
Answer (C) is incorrect because this percentage results from improperly using the before-tax cost of debt.
Answer (D) is incorrect because this percentage results from performing a simple average on just the preferred stock and common equity components.
The following is an excerpt from Albion Corporation’s balance sheet:

- Long-term debt (9% interest rate) $30,000,000
- Preferred stock (100,000 shares, 12% dividend) 10,000,000
- Common stock (5,000,000 shares outstanding) 60,000,000

Albion’s bonds are currently trading at $1,083.34, reflecting a yield to maturity of 8%. The preferred stock is trading at $125 per share. Common stock is selling at $16 per share, and Albion’s treasurer estimates that the firm’s cost of equity is 17%. If Albion’s effective income tax rate is 40%, what is the firm’s cost of capital?

A. 12.67%
B. 13.09%
C. 13.86%
D. 14.18%

- Answer (A) is incorrect because the percentage of 12.67% results from calculating a simple average of the rate of the bonds, the rate of the preferred stock, and the estimated cost of equity.
- Answer (B) is correct. The effective rate for Albion’s debt is the after-tax cost [8% yield × (1.0 – .40 tax rate)] = 4.8%. The component cost of preferred stock equals the cash dividend divided by the market price [(100 × 12%) ÷ 125 = 9.6%]. Thus, the weighted-average cost of capital (WACC) is calculated as follows:

<table>
<thead>
<tr>
<th>Market Value</th>
<th>Weight</th>
<th>Cost of Capital</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>$32,500,000&lt;sup&gt;1&lt;/sup&gt;</td>
<td>26%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>12,500,000&lt;sup&gt;2&lt;/sup&gt;</td>
<td>10%</td>
<td>9.6%</td>
</tr>
<tr>
<td>Common stock</td>
<td>80,000,000&lt;sup&gt;3&lt;/sup&gt;</td>
<td>64%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Totals</td>
<td>$125,000,000</td>
<td>100%</td>
<td>13.09%</td>
</tr>
</tbody>
</table>

1 ($1,083.34 market ÷ $1,000 carrying amount) × $30,000,000 = $32,500,000

2 $125 market price × 100,000 shares outstanding = $12,500,000

3 $16 market price × 5,000,000 shares outstanding = $80,000,000

- Answer (C) is incorrect because the percentage of 13.86% results from using the bonds’ yield rather than the after-tax interest cost.
- Answer (D) is incorrect because the percentage of 14.18% results from improperly using the bonds’ nominal rate.
Thomas Company’s capital structure consists of 30% long-term debt, 25% preferred stock, and 45% common equity. The cost of capital for each component is shown below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost of Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>8%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>11%</td>
</tr>
<tr>
<td>Common equity</td>
<td>15%</td>
</tr>
</tbody>
</table>

If Thomas pays taxes at the rate of 40%, what is the company’s after-tax weighted average cost of capital?

A. 7.14%
B. 9.84%
C. 10.94%
D. 11.90%

- Answer (A) is incorrect because this percentage results from improperly applying the tax effect to the rates on preferred stock and common equity.
- Answer (B) is incorrect because this percentage results from improperly applying the tax effect to the rate on preferred stock.
- Answer (C) is correct. The effective rate for Thomas’ debt is the after-tax cost \(8\% \times (1.0 - .40 \text{ tax rate}) = 4.8\%\). The weighted-average cost of capital (WACC) can thus be calculated as follows:

<table>
<thead>
<tr>
<th>Weight</th>
<th>Cost of Capital</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>30% × 4.8%</td>
<td>1.44%</td>
</tr>
<tr>
<td>Preferred stock</td>
<td>25% × 11.0%</td>
<td>2.75%</td>
</tr>
<tr>
<td>Common equity</td>
<td>45% × 15.0%</td>
<td>6.75%</td>
</tr>
<tr>
<td>Totals</td>
<td>100%</td>
<td>10.94%</td>
</tr>
</tbody>
</table>

- Answer (D) is incorrect because this percentage results from failing to adjust the rate on debt for the tax effect.

Joint Products, Inc., a corporation with a 40% marginal tax rate, plans to issue $1,000,000 of 8% preferred stock in exchange for $1,000,000 of its 8% bonds currently outstanding. The firm’s total liabilities and equity are equal to $10,000,000. The effect of this exchange on the firm’s weighted average cost of capital is likely to be

A. No change, since it involves equal amounts of capital in the exchange and both instruments have the same rate.
B. A decrease, since a portion of the debt payments are tax deductible.
C. A decrease, since preferred stock payments do not need to be made each year, whereas debt payments must be made.
D. An increase, since a portion of the debt payments are tax deductible.

- Answer (A) is incorrect because while the dollar amounts may be equal, the different effective rates on the two instruments will cause a change in the cost of capital.
- Answer (B) is incorrect because the cost of capital will increase (debt is being replaced by preferred stock, not the other way around).
- Answer (C) is incorrect because the preferred stock has a higher effective rate, leading to an increase in the cost of capital.
- Answer (D) is correct. The payment of interest on bonds is tax-deductible, whereas dividends on preferred stock must be paid out of after-tax earnings. Thus, when bonds are replaced in the capital structure with preferred stock, an increase in the cost of capital is likely because there is no longer a tax shield.
Zeta Corporation’s current-year earnings are $2.00 per share. Using a discounted cash flow model, the controller determines that Zeta’s common stock is worth $14 per share. Assuming a 5% long-term growth rate, Zeta’s required rate of return is which one of the following?

A. 20%
B. 15%
C. 10%
D. 7%

- Answer (A) is correct. The dividend discount model (also known as the dividend growth model) is a method of arriving at the value of a stock by using expected dividends per share and discounting them back to present value. The formula is as follows:

\[
\frac{\text{Dividends per share}}{\text{Cost of capital} - \text{Dividend growth rate}}
\]

The current-year earnings per share are $2.00. In order to calculate the correct dividend per share amount when given only the amount of the last annual dividend paid, it is necessary to adjust to the expected dividend using the growth rate of the company. Thus, the dividends per share equal $2.10 \(\$2 \times (1 + .05)\).

The rate of return can now be solved for as follows:

\[
\frac{2.10}{x - .05} = 14
\]

\[
2.10 = 14x - .70
\]

\[
2.80 = 14x
\]

\[
x = 20%
\]

- Answer (B) is incorrect because this answer choice forgets to subtract the dividend growth rate from the cost of capital in the denominator and thus calculates an incorrect rate of return of 15%.
- Answer (C) is incorrect because the amount of 10% incorrectly multiplies the long-term growth rate of 5% by the earnings per share of $2.00 to calculate the required rate of return.
- Answer (D) is incorrect because this answer choice incorrectly multiplies the $14 common stock price times the growth rate and the dividend of 2 times the growth rate in order to figure out the rate of return. When those two incorrect figures are multiplied together, it calculates the 7% provided in this answer choice.
A firm’s new financing will be in proportion to the market value of its current financing shown below.

<table>
<thead>
<tr>
<th>Carrying Amount</th>
<th>($000 Omitted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td>$7,000</td>
</tr>
<tr>
<td>Preferred stock (100,000 shares)</td>
<td>1,000</td>
</tr>
<tr>
<td>Common stock (200,000 shares)</td>
<td>7,000</td>
</tr>
</tbody>
</table>

The firm’s bonds are currently selling at 80% of par, generating a current market yield of 9%, and the corporation has a 40% tax rate. The preferred stock is selling at its par value and pays a 6% dividend. The common stock has a current market value of $40 and is expected to pay a $1.20 per share dividend this fiscal year. Dividend growth is expected to be 10% per year, and flotation costs are negligible. The firm’s weighted-average cost of capital is (round calculations to tenths of a percent)

A. 13.0%
B. 8.13%
C. 9.6%
D. 9.0%

- Answer (A) is incorrect because this percentage is the cost of equity.
- Answer (B) is incorrect because this percentage is the simple average.
- Answer (C) is correct. The first step is to determine the component costs of each form of capital. Multiplying the current yield of 9% (since the coupon rate is not given) times one minus the tax rate (1.0 – .40 = .60) results in an after-tax cost of debt of 5.4% (9% × .60). Since the preferred stock is trading at par, the component cost is 6% (the annual dividend rate). The component cost of common equity is calculated using the dividend growth model, which combines the dividend yield with the growth rate. Dividing the $1.20 dividend by the $40 market price produces a dividend yield of 3%. Adding the 3% dividend yield and the 10% growth rate gives a 13% component cost of common equity.

Once the costs of the three types of capital have been computed, the next step is to weight them according to their current market values. The market value of the long-term debt is 80% of its carrying amount, or $5,600,000 ($7,000,000 × 80%). The $1,000,000 of preferred stock is selling at par. The common stock has a current market value of $8,000,000 (200,000 shares × $40).

| Long-term debt | $5,600,000 × 5.4% = $302,400 |
| Preferred stock | 1,000,000 × 6.0% = 60,000 |
| Common stock    | 8,000,000 × 13.0% = 1,040,000 |
| Totals          | $14,600,000 $1,402,400 |

Thus, the weighted-average cost of capital is 9.6% ($1,402,000 ÷ $14,600,000).

- Answer (D) is incorrect because this percentage is based on carrying amounts.

A preferred stock is sold for $101 per share, has a face value of $100 per share, underwriting fees of $5 per share, and annual dividends of $10 per share. If the tax rate is 40%, the cost of funds (capital) for the preferred stock is

A. 4.2%
B. 6.25%
C. 10.0%
D. 10.4%

- Answer (A) is incorrect because this figure results from improperly multiplying the dividends by the tax rate.
- Answer (B) is incorrect because this figure results from improperly multiplying the dividends by the tax rate.
Answer (C) is incorrect because this figure results from improperly basing the calculation on par value funds received.

Answer (D) is correct. The cost of capital for new preferred stock is equal to the dividend on the stock divided by the net issue proceeds [$10 ÷ ($101 – $5) = 10.4%]. Because dividends on preferred stock are not deductible for tax purposes, the income tax rate is irrelevant.

[Fact Pattern #69]
The FLF Corporation is preparing to evaluate capital expenditure proposals for the coming year. Because the firm employs discounted cash flow methods, the cost of capital for the firm must be estimated. The following information for FLF Corporation is provided:

- The market price of common stock is $60 per share.
- The dividend next year is expected to be $3 per share.
- Expected growth in dividends is a constant 10%.
- New bonds can be issued at face value with a 10% coupon rate.
- The current capital structure of 40% long-term debt and 60% equity is considered to be optimal.
- Anticipated earnings to be retained in the coming year are $3 million.
- The firm has a 40% marginal tax rate.

[558] (Refers to Fact Pattern #69)
The after-tax cost to FLF Corporation of the new bond issue is

A. 4%
B. 6%
C. 10%
D. 14%

- Answer (A) is incorrect because this figure results from using a 60% tax rate.
- Answer (B) is correct. Because the bonds are issued at their face value, the pretax effective rate is 10%. However, interest is deductible for tax purposes, so the government absorbs 40% of the cost, leaving a 6% after-tax cost.
- Answer (C) is incorrect because this figure is the before-tax rate.
- Answer (D) is incorrect because the after-tax cost will be less than the effective before-tax rate.

[559] (Refers to Fact Pattern #69)
If FLF Corporation must assume a 20% flotation cost on new stock issuances, what is the cost of new common stock?

A. 6.25%
B. 15%
C. 16.25%
D. 10%

- Answer (A) is incorrect because this figure results from failing to add the dividend growth rate.
- Answer (B) is incorrect because this figure results from ignoring the flotation costs.
- Answer (C) is correct. The company will receive only 80% of the $60 market price, or $48. Consequently, the dividend yield is 6.25% ($3 ÷ $48). Adding the 10% growth rate produces a cost of new common equity of 16.25%.
- Answer (D) is incorrect because this figure is the dividend growth rate.
The cost of using FLF Corporation retained earnings for financing is

A. 5%  
B. 9%  
C. 10%  
D. 15%

- Answer (A) is incorrect because this figure results from failing to add the dividend growth rate.
- Answer (B) is incorrect because this figure would be the after-tax cost if dividends were deductible.
- Answer (C) is incorrect because this figure is the dividend growth rate.
- Answer (D) is correct. The cost of internal equity capital equals the dividend yield (dividends per share ÷ market price) plus the dividend growth rate. Dividing the $3 dividend by the $60 market price results in a yield of 5%. Adding the 10% dividend growth rate produces a cost of 15% for retained earnings. No adjustment is made for taxes because dividends are not tax deductible.

The maximum capital expansion that FLF Corporation can support in the coming year without resorting to external equity financing is

A. $2 million.  
B. $3 million.  
C. $5 million.  
D. Cannot determine from the information given.

- Answer (A) is incorrect because two million is the amount of debt that must be added to maintain the optimal structure.
- Answer (B) is incorrect because three million is the amount of earnings retained.
- Answer (C) is correct. The current optimal capital structure is 40% debt and 60% equity. The $3 million to be retained from earnings in the coming year represents the equity portion of the maximum new capital outlay. To retain the optimal capital structure, $2 million of debt must be added to the $3 million of retained earnings. Hence, the maximum capital expansion is $5 million.
- Answer (D) is incorrect because the amount of $5 million can be calculated.

Without prejudice to your answers from any other questions, assume that the after-tax cost of debt financing is 10%, the cost of retained earnings is 14%, and the cost of new common stock is 16%. If capital expansion needs to be $7 million for the coming year, what is the after-tax weighted-average cost of capital to FLF Corporation?

A. 11.14%  
B. 12.74%  
C. 13.6%  
D. 16%

- Answer (A) is incorrect because this figure assumes a tax adjustment for the cost of debt, but the 10% rate is an after-tax amount.
Answer (B) is correct. To maintain a capital structure of 40% debt and 60% equity, the $7 million total must consist of $2.8 million of debt and $4.2 million of equity. The equity will consist of $3 million of retained earnings and $1.2 million of new stock. The weighted-average cost of the three sources of new capital is determined as follows:

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt</td>
<td>$2,800,000</td>
<td>4.00%</td>
</tr>
<tr>
<td>Common stock</td>
<td>$1,200,000</td>
<td>2.74%</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>$3,000,000</td>
<td>6.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$7,000,000</td>
<td><strong>12.74%</strong></td>
</tr>
</tbody>
</table>

Answer (C) is incorrect because this figure assumes the equity consists solely of new common stock.

Answer (D) is incorrect because this figure is the cost of new common stock.

[563] (Refers to Fact Pattern #69)

Without prejudice to your answers from any other questions, assume that the after-tax cost of debt financing is 10%, the cost of retained earnings is 14%, and the cost of new common stock is 16%. What is the marginal cost of capital to FLF Corporation for any projected capital expansion in excess of $7 million?

A. 10%
B. 12.74%
C. 13.6%
D. 16%

Answer (A) is incorrect because this percentage is the cost of debt capital.

Answer (B) is incorrect because this percentage is the weighted-average cost of capital calculated for a $7 million budget.

Answer (C) is correct. For this calculation, the weighted-average cost of capital is based on the 16% cost of new common stock and the 10% cost of debt. Retained earnings will not be considered because the amount available has been exhausted. Thus, the weighted average of any additional capital required will be 13.6% [(60% x 16% cost of new equity) + (40% x 10% cost of new debt)].

Answer (D) is incorrect because this percentage is the cost of new common stock.
Williams, Inc., is interested in measuring its overall cost of capital and has gathered the following data. Under the terms described as follows, the company can sell unlimited amounts of all instruments.

- Williams can raise cash by selling $1,000, 8%, 20-year bonds with annual interest payments. In selling the issue, an average premium of $30 per bond would be received, and the firm must pay flotation costs of $30 per bond. The after-tax cost of funds is estimated to be 4.8%.
- Williams can sell $8 preferred stock at par value, $105 per share. The cost of issuing and selling the preferred stock is expected to be $5 per share.
- Williams’ common stock is currently selling for $100 per share. The firm expects to pay cash dividends of $7 per share next year, and the dividends are expected to remain constant. The stock will have to be underpriced by $3 per share, and flotation costs are expected to amount to $5 per share.
- Williams expects to have available $100,000 of retained earnings in the coming year; once these retained earnings are exhausted, the firm will use new common stock as the form of common stock equity financing.
- Williams’ preferred capital structure is

<table>
<thead>
<tr>
<th></th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term debt</td>
<td></td>
</tr>
<tr>
<td>Preferred stock</td>
<td>20%</td>
</tr>
<tr>
<td>Common stock</td>
<td>50%</td>
</tr>
</tbody>
</table>

[564] (Refers to Fact Pattern #70)
The cost of funds from the sale of common stock for Williams, Inc., is

A. 7.0%
B. 7.6%
C. 7.4%
D. 8.1%

- Answer (A) is incorrect because This figure results from failing to subtract the discount and flotation costs.
- Answer (B) is correct. According to the dividend growth model, the cost of new (external) common equity is the next dividend divided by the net issue proceeds plus the dividend growth rate. Since flotation costs are incurred when issuing new stock, they must be deducted from the market price to arrive at the amount of capital the corporation will actually receive. Accordingly, the $100 selling price is reduced by the $3 discount and the $5 flotation costs to arrive at the $92 to be received for the stock. Because the dividend is not expected to increase in future years, no growth factor is included in the calculation. Thus, the cost of the common stock is 7.6% ($7 dividend ÷ $92 net issue proceeds).
- Answer (C) is incorrect because This figure results from failing to subtract the discount.
- Answer (D) is incorrect because This figure would be correct only if the amount received were about $86 or if some growth factor were assumed.

[565] (Refers to Fact Pattern #70)
The cost of funds from retained earnings for Williams, Inc., is

A. 7.0%
B. 7.6%
C. 7.4%
D. 8.1%
Answer (A) is correct. Because retained earnings is internally generated (that is, no issue costs are involved), its cost is simply the component cost of common stock, i.e., the next dividend divided by the market price ($7 ÷ $100 = 7.0\%$).

Answer (B) is incorrect because this figure is the cost of new common stock.

Answer (C) is incorrect because this figure is the cost of new common stock after failing to subtract the discount.

Answer (D) is incorrect because dividing the $7 dividend by the $100 market price of the stock produces a ratio of 7\%, not 8.1\%.

[566] (Refers to Fact Pattern #70)

If Williams, Inc., needs a total of $200,000, the firm’s weighted-average cost of capital would be

A. 19.8\%
B. 4.8\%
C. 6.5\%
D. 6.8\%

Answer (A) is incorrect because this figure is the unweighted sum of each of the three elements of capital.

Answer (B) is incorrect because this figure is the cost of long-term debt alone. The firm wants to maintain a capital structure in which debt represents only 30\% of the total capital.

Answer (C) is correct. Because Williams can sell unlimited amounts of all of its instruments, it can maintain its preferred capital structure. The cost of new debt is given as 4.8\%. The cost of new preferred stock is 8.0\% ($8 dividend ÷ $100 net issue proceeds). No new common stock needs to be issued since sufficient retained earnings are available ($200,000 capital needed × 50\% common stock = $100,000). Thus, the component cost of retained earnings can be used for the common stock component of the WACC calculation:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Cost of Capital</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>New long-term debt</td>
<td>30%</td>
<td>4.8%</td>
<td>1.44%</td>
</tr>
<tr>
<td>New preferred stock</td>
<td>20%</td>
<td>8.0%</td>
<td>1.60%</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>50%</td>
<td>7.0%</td>
<td>3.50%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>6.54%</td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because this figure can only be obtained if new common stock is sold. New common stock will not be sold because the retained earnings can be used at a lower cost, and there is no need to sell stock when the total capital required is only $200,000.

[567] (Refers to Fact Pattern #70)

If Williams, Inc., needs a total of $1,000,000, the firm’s weighted-average cost of capital would be

A. 6.8\%
B. 4.8\%
C. 6.5\%
D. 27.4\%
Answer (A) is correct. Because Williams can sell unlimited amounts of all of its instruments, it can maintain its preferred capital structure. The cost of new debt is given as 4.8%. The cost of new preferred stock is 8.0% ($8 dividend ÷ $100 net issue proceeds). The common equity component will amount to $300,000 ($1,000,000 capital needed × 50% common stock). Retained earnings are available to cover $100,000 (10% of the total), so new common stock will have to be issued to cover the other 40%. The cost of new common stock is 7.6% ($7 dividend ÷ $92 net issue proceeds).

<table>
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<td>1.60%</td>
</tr>
<tr>
<td>New common stock</td>
<td>40%</td>
<td>7.6%</td>
<td>3.04%</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>10%</td>
<td>7.0%</td>
<td>.70%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>6.78%</strong></td>
</tr>
</tbody>
</table>

Answer (B) is incorrect because this percentage is the cost of the long-term debt alone.
Answer (C) is incorrect because this percentage would be correct only if the equity capital were obtained totally from retained earnings. Because only $100,000 of retained earnings is available, the remainder of equity capital must come from sales of new common stock.
Answer (D) is incorrect because this percentage is the unweighted total of each of the four elements of capital.

**[Fact Pattern #71]**

DQZ Telecom is considering a project for the coming year that will cost $50 million. DQZ plans to use the following combination of debt and equity to finance the investment.

- Issue $15 million of 20-year bonds at a price of $101, with a coupon rate of 8%, and flotation costs of 2% of par.
- Use $35 million of funds generated from earnings.
- The equity market is expected to earn 12%. U.S. Treasury bonds are currently yielding 5%. The beta coefficient for DQZ is estimated to be .60. DQZ is subject to an effective corporate income tax rate of 40%.

**[568]** (Refers to Fact Pattern #71)

The before-tax cost of DQZ’s planned debt financing, net of flotation costs, in the first year is

A. 11.80%
B. 8.08%
C. 10.00%
D. 7.92%

Answer (A) is incorrect because the contract rate is 8% annually.
Answer (B) is correct. The cost of new debt equals the annual interest divided by the net issue proceeds. The annual interest is $1.2 million ($15,000,000 × .08 coupon rate). The proceeds amount to $14,850,000 [$15,000,000 × 1.01] market price – ($15,000,000 × .02) flotation costs. Thus, the company is paying $1.2 million annually for the use of $14,850,000, a cost of 8.08% ($1,200,000 ÷ $14,850,000).
Answer (C) is incorrect because this percentage is the sum of the coupon rate and the flotation rate.
Answer (D) is incorrect because this percentage ignores the 2% flotation costs.
Assume that the after-tax cost of debt is 7% and the cost of equity is 12%. Determine the weighted-average cost of capital to DQZ.

A. 10.50%
B. 8.50%
C. 9.50%
D. 6.30%

- Answer (A) is correct. The 7% debt cost and the 12% equity cost should be weighted by the proportions of the total investment represented by each source of capital. The total project costs $50 million, of which debt is $15 million, or 30% of the total. Equity capital is the other 70%. Consequently, the weighted-average cost of capital is 10.5% \( (30\% \times 7\%) + (70\% \times 12\%) \).
- Answer (B) is incorrect because this percentage reverses the weights.
- Answer (C) is incorrect because this percentage assumes debt and equity are equally weighted.
- Answer (D) is incorrect because this percentage assumes that 7% is the before-tax cost of debt and that equity is tax deductible.

The common stock of the Nicolas Corporation is currently selling at $80 per share. The leadership of the company intends to pay a $4 per share dividend next year. With the expectation that the dividend will grow at 5% perpetually, what will the market’s required return on investment be for Nicolas common stock?

A. 5%
B. 5.25%
C. 7.5%
D. 10%

- Answer (A) is incorrect because this percentage represents only half of the return elements (either yield or growth).
- Answer (B) is incorrect because the growth rate is based on market value, not yield.
- Answer (C) is incorrect because the yield and growth rate are 5% each, a total of 10%.
- Answer (D) is correct. The dividend growth model estimates the cost of retained earnings using the dividends per share, the market price, and the expected growth rate. The current dividend yield is 5% \( (4 \div 80) \). Adding the growth rate of 5% to the yield of 5% results in a required return of 10%.
Enert, Inc.’s current capital structure is shown below. This structure is optimal, and the company wishes to maintain it.

- Debt 25%
- Preferred equity 5%
- Common equity 70%

Enert’s management is planning to build a $75 million facility that will be financed according to this desired capital structure. Currently, $15 million of cash is available for capital expansion. The percentage of the $75 million that will come from a new issue of common stock is

A. 52.50%
B. 50.00%
C. 70.00%
D. 56.00%

- Answer (A) is incorrect because the 70% desired common stock percentage multiplied by the original $75 million is $52.5 million.
- Answer (B) is incorrect because this is a nonsense percentage in this context.
- Answer (C) is incorrect because the new issue of common stock will fund 70% of the financed amount, not 70% of the total project cost. The financed amount is $60 million ($75 million – $15 million cash).
- Answer (D) is correct. Because $15 million is already available, the company must finance $60 million ($75 million – $15 million). Of this amount, 70%, or $42 million, should come from the issuance of common stock to maintain the current capital structure. The $42 million represents 56% of the total $75 million.

Which one of a firm’s sources of new capital usually has the lowest after-tax cost?

A. Retained earnings.
B. Bonds.
C. Preferred stock.
D. Common stock.

- Answer (A) is incorrect because the cost to the company of equity instruments is in the form of dividends. Because dividends are not deductible for tax purposes, equity sources of capital have a higher after-tax cost than debt sources.
- Answer (B) is correct. Debt financing, such as bonds, normally has a lower after-tax cost than does equity financing. The interest on debt is tax deductible, whereas the dividends on equity are not. Also, bonds are slightly less risky than stock because the bondholders have a first right to assets at liquidation.
- Answer (C) is incorrect because Preferred stock has a higher after-tax cost than debt.
- Answer (D) is incorrect because Common stock has a higher after-tax cost than debt.
The DCL Corporation is preparing to evaluate the capital expenditure proposals for the coming year. Because the firm employs discounted cash flow methods of analyses, the cost of capital for the firm must be estimated. The following information for DCL Corporation is provided:

- Market price of common stock is $50 per share.
- The dividend next year is expected to be $2.50 per share.
- Expected growth in dividends is a constant 10%.
- New bonds can be issued at face value with a 13% coupon rate.
- The current capital structure of 40% long-term debt and 60% equity is considered to be optimal.
- Anticipated earnings to be retained in the coming year are $3 million.
- The firm has a 40% marginal tax rate.

If the firm must assume a 10% flotation cost on new stock issuances, what is the cost of new common stock?

A. 16.11%
B. 15.56%
C. 15.05%
D. 15.00%

Answer (A) is incorrect because assuming next year’s dividend grew by 10% results in 16.11%.
Answer (B) is correct. Because of flotation costs, DCL will only receive $45 from each new common share issued ($50 × 90%). The cost of this new common equity issue can thus be calculated as follows:

Cost of new common stock = \( \frac{\text{Next dividend}}{\text{Net issue proceeds}} + \text{Dividend growth rate} \)
= \( \frac{2.50}{45.00} + 0.1 \)
= 0.0556 + 0.1
= 0.1556

Answer (C) is incorrect because using the present value of the dividend to be received next year results in 15.05%.
Answer (D) is incorrect because this percentage did not take into account flotation costs.

Rogers, Inc., operates a chain of restaurants located in the Southeast. The company has steadily grown to its present size of 48 restaurants. The board of directors recently approved a large-scale remodeling of the restaurants, and the company is now considering two financing alternatives.

The first alternative would consist of
1. Bonds that would have a 9% coupon rate and reissued at their base amount would net $19.2 million after a 4% flotation cost
2. Preferred stock with a stated rate of 6% that would yield $4.8 million after a 4% flotation cost
3. Common stock that would yield $24 million after a 5% flotation cost

The second alternative would consist of a public offering of bonds that would have a 9% coupon rate and an 11% market rate and would net $48 million after a 4% flotation cost.

Rogers’ current capital structure, which is considered optimal, consists of 40% long-term debt, 10% preferred stock, and 50% common stock. The current market value of the common stock is $30 per share, and the common stock dividend during the past 12 months was $3 per share. Investors are expecting the growth rate of dividends to equal the historical rate of 6%. Rogers is subject to an effective income tax rate of 40%.
The after-tax cost of the common stock proposed in Rogers’ first financing alternative would be

A. 16.00%
B. 16.53%
C. 16.60%
D. 17.16%

- Answer (A) is incorrect because this percentage ignores the increase in dividends and flotation costs.
- Answer (B) is incorrect because this percentage ignores the increase in the next dividend.
- Answer (C) is incorrect because this percentage ignores the flotation costs.
- Answer (D) is correct. To determine the cost of new common stock, the dividend growth model is used.

\[
\text{Cost of new common stock} = (\text{Next dividend} \div \text{Net issue proceeds}) + \text{Dividend growth rate}
\]

\[
= \left( \frac{$3.00 \times 1.06}{$30.00 \times .95} \right) + .06
\]

\[
= \left( \frac{$3.18}{$28.50} \right) + .06
\]

\[
= .1116 + .06
\]

\[
= 17.16%
\]

Assuming the after-tax cost of common stock is 15%, the after-tax weighted marginal cost of capital for Rogers’ first financing alternative consisting of bonds, preferred stock, and common stock would be

A. 7.285%
B. 8.725%
C. 10.375%
D. 11.700%

- Answer (A) is incorrect because they do not appear to be the result of a common error.
- Answer (B) is incorrect because they do not appear to be the result of a common error.
- Answer (C) is correct. Since the bonds would incur a 4% flotation cost, their face amount must be $20,000,000 ($19,200,000 ÷ .96). The before-tax rate of return on the debt is therefore .09375 [($20,000,000 × 9%) ÷ $19,200,000]. The preferred stock will yield $4,800,000 after subtracting the 4% flotation cost, so it must sell for $5,000,000 ($4,800,000 ÷ .96). The annual dividend on the preferred stock is $300,000 ($5,000,000 × 6%). Consequently, the cost of capital raised by issuing preferred stock is 6.25% ($300,000 dividend ÷ $4,800,000 net issuance price). The after-tax weighted marginal cost of capital for Rogers’ first financing alternative is therefore calculated as follows:

\[
\begin{array}{cccc}
\text{Weight} & \text{Cost of Capital} & \text{Weighted Cost} \\
\text{Long-term debt} & 40\% \times 9.375\% \times (1.0 - .40) & = & 2.250\% \\
\text{Preferred stock} & 10\% \times 6.25\% & = & .625\% \\
\text{Common stock} & 50\% \times 15\% & = & 7.500\% \\
\end{array}
\]

\[
= 10.375\%
\]

- Answer (D) is incorrect because they do not appear to be the result of a common error.
The after-tax weighted marginal cost of capital for Rogers’ second financing alternative consisting solely of bonds would be

A. 5.13%
B. 5.40%
C. 5.63%
D. 6.60%

- Answer (A) is incorrect because this percentage (5.13%) is 5.40% reduced by the 5% stock flotation costs.
- Answer (B) is incorrect because this percentage (5.40%) is 60% of 9%.
- Answer (C) is correct. Annual cash interest is $4,500,000\[\left(\frac{48,000,000}{1.0 - .04 \text{ flotation cost}}\right) \times .09\]. The cost of the new bonds equals the annual cash interest divided by the net issue proceeds, times one minus the tax rate, or 5.63%\[\left(\frac{4,500,000}{48,000,000} \times (100\% - 40\%)\right)\].
- Answer (D) is incorrect because this percentage (6.60%) is the market interest rate times one minus the tax rate.

The interest rate on the bonds is greater to Rogers, Inc., for the second alternative consisting of pure debt than it is for the first alternative consisting of both debt and equity because the

A. Diversity of the combination alternative creates greater risk for the investor.
B. Pure debt alternative would flood the market and be more difficult to sell.
C. Pure debt alternative carries the risk of increasing the probability of default.
D. Combination alternative carries the risk of increasing dividend payments.

- Answer (A) is incorrect because the diversity decreases, not increases, risk.
- Answer (B) is incorrect because the amount of $50,000,000 is minuscule in the debt markets.
- Answer (C) is correct. As a larger proportion of an entity’s capital is provided by debt, the debt becomes riskier and more expensive. Hence, it requires a higher interest rate.
- Answer (D) is incorrect because the combination alternative maintains the same debt-equity mixture, which would not warrant a rate increase in the cost of debt or equity.

Maylar Corporation has sold $50 million of $1,000 par value, 12% coupon bonds. The bonds were sold at a discount and the corporation received $985 per bond. If the corporate tax rate is 40%, the after-tax cost of these bonds for the first year (rounded to the nearest hundredth percent) is

A. 7.31%
B. 4.87%
C. 12.00%
D. 7.09%

- Answer (A) is correct. Interest is 12%, and the annual interest payment on one bond is $120. Thus, the effective rate is 12.18% ($120 ÷ $985). Reducing this rate by the 40% tax savings lowers the cost to 7.31%.
- Answer (B) is incorrect because multiplying the pretax effective rate 12.18% ($120 ÷ $985) by the tax rate of .40 instead of by (1 – .40) results in 4.87%.
- Answer (C) is incorrect because the nominal interest rate is 12%.
Answer (D) is incorrect because the after-tax cost of the bonds equals the effective rate times the tax effect.

Acme Corporation is selling $25 million of cumulative, non-participating preferred stock. The issue will have a par value of $65 per share with a dividend rate of 6%. The issue will be sold to investors for $68 per share, and issuance costs will be $4 per share. The cost of preferred stock to Acme is

A. 5.42%
B. 5.74%
C. 6.00%
D. 6.09%

Answer (A) is incorrect because improperly dividing the annual dividend by the sum of the issue price and the issue costs results in 5.42%.
Answer (B) is incorrect because improperly dividing the annual dividend by the issue price results in 5.74%.
Answer (C) is incorrect because improperly dividing the annual dividend by the par value results in 6.00%.
Answer (D) is correct. Acme’s cost of capital for its new preferred stock is calculated as follows:

Cost of new preferred stock = Dividend ÷ Net issue proceeds
                           = ($65 × 6%) ÷ ($68 – $4)
                           = $3.90 ÷ $64
                           = 6.09%

By using the dividend growth model, estimate the cost of equity capital for a firm with a stock price of $30.00, an estimated dividend at the end of the first year of $3.00 per share, and an expected growth rate of 10%.

A. 21.1%
B. 12.2%
C. 11.0%
D. 20.0%

Answer (A) is incorrect because the sum of the growth rate (10%) and the dividend incorrectly divided by the share price discounted one year equals 21.1%.
Answer (B) is incorrect because this is a bogus percentage.
Answer (C) is incorrect because the growth rate (10%) plus 10% of the current dividend yield (10%) equals 11.0%.
Answer (D) is correct. Under the dividend growth model, the cost of equity equals the expected growth rate plus the quotient of the next dividend and the current market price. Thus, the cost of equity capital is 20% \[10\% + ($3 ÷ 30)] This model assumes that the payout ratio, retention rate, and the earnings per share growth rate are all constant.
A firm seeking to optimize its capital budget has calculated its marginal cost of capital and projected rates of return on several potential projects. The optimal capital budget is determined by

A. Calculating the point at which marginal cost of capital meets the projected rate of return, assuming that the most profitable projects are accepted first.
B. Calculating the point at which average marginal cost meets average projected rate of return, assuming the largest projects are accepted first.
C. Accepting all potential projects with projected rates of return exceeding the lowest marginal cost of capital.
D. Accepting all potential projects with projected rates of return lower than the highest marginal cost of capital.

- Answer (A) is correct. In economics, a basic principle is that a firm should increase output until marginal cost equals marginal revenue. Similarly, the optimal capital budget is determined by calculating the point at which marginal cost of capital (which increases as capital requirements increase) and marginal efficiency of investment (which decreases if the most profitable projects are accepted first) intersect.
- Answer (B) is incorrect because The intersection of average marginal cost with average projected rates of return when the largest (not most profitable) projects are accepted first offers no meaningful capital budgeting conclusion.
- Answer (C) is incorrect because The optimal capital budget may exclude profitable projects as lower-cost capital goes first to projects with higher rates of return.
- Answer (D) is incorrect because Accepting projects with rates of return lower than the cost of capital is not rational.

A company has made the decision to finance next year’s capital projects through debt rather than additional equity. The benchmark cost of capital for these projects should be

A. The before-tax cost of new-debt financing.
B. The after-tax cost of new-debt financing.
C. The cost of equity financing.
D. The weighted-average cost of capital.

- Answer (A) is incorrect because The cost of capital is a composite, or weighted average, of all financing sources in their usual proportions. The cost of capital should also be calculated on an after-tax basis.
- Answer (B) is incorrect because The cost of capital is a composite, or weighted average, of all financing sources in their usual proportions. The cost of capital should also be calculated on an after-tax basis.
- Answer (C) is incorrect because The cost of capital is a composite, or weighted average, of all financing sources in their usual proportions. The cost of capital should also be calculated on an after-tax basis.
- Answer (D) is correct. A weighted average of the costs of all financing sources should be used, with the weights determined by the usual financing proportions. The terms of any financing raised at the time of initiating a particular project do not represent the cost of capital for the firm. When a firm achieves its optimal capital structure, the weighted-average cost of capital is minimized.

The firm’s marginal cost of capital

A. Should be the same as the firm’s rate of return on equity.
B. Is unaffected by the firm’s capital structure.
C. Is inversely related to the firm’s required rate of return used in capital budgeting.
D. Is a weighted average of the investors’ required returns on debt and equity.

- Answer (A) is incorrect because If the cost of capital were the same as the rate of return on equity (which is usually higher than that of debt capital), there would be no incentive to invest.
Answer (B) is incorrect because the marginal cost of capital is affected by the degree of debt in the firm’s capital structure. Financial risk plays a role in the returns desired by investors.

Answer (C) is incorrect because the rate of return used for capital budgeting purposes should be at least as high as the marginal cost of capital.

Answer (D) is correct. The marginal cost of capital is the cost of the next dollar of capital. The marginal cost continually increases because the lower cost sources of funds are used first. The marginal cost represents a weighted average of both debt and equity capital.

Datacomp Industries, which has no current debt, has a beta of .95 for its common stock. Management is considering a change in the capital structure to 30% debt and 70% equity. This change would increase the beta on the stock to 1.05, and the after-tax cost of debt will be 7.5%. The expected return on equity is 16%, and the risk-free rate is 6%. Should Datacomp’s management proceed with the capital structure change?

A. No, because the cost of equity capital will increase.
B. Yes, because the cost of equity capital will decrease.
C. Yes, because the weighted-average cost of capital will decrease.
D. No, because the weighted-average cost of capital will increase.

Answer (A) is incorrect because the average cost of capital needs to be considered.
Answer (B) is incorrect because the average cost of capital needs to be considered.
Answer (C) is correct. The important consideration is whether the overall cost of capital will be lower for a given proposal. According to the Capital Asset Pricing Model, the change will result in a lower average cost of capital. For the existing structure, the cost of equity capital is 15.5% [6% + .95 (16% – 6%)]. Because the company has no debt, the average cost of capital is also 15.5%. Under the proposal, the cost of equity capital is 16.5% [6% + 1.05 (16% – 6%)], and the weighted average cost of capital is 13.8% [.3(.075) + .7(.165)]. Hence, the proposal of 13.8% should be accepted.
Answer (D) is incorrect because the weighted average cost of capital will decrease.

Cox Company has sold 1,000 shares of $100 par, 8% preferred stock at an issue price of $92 per share. Stock issue costs were $5 per share. Cox pays taxes at the rate of 40%. What is Cox’s cost of preferred stock capital?

A. 8.00%
B. 8.25%
C. 8.70%
D. 9.20%

Answer (A) is incorrect because this percentage results from using the par value rather than the selling price and failing to subtract the issue costs.
Answer (B) is incorrect because this percentage results from adding the issue costs rather than subtracting them.
Answer (C) is incorrect because this percentage results from failing to subtract the issue costs.
Answer (D) is correct. Because the dividends on preferred stock are not deductible for tax purposes, the effect of income taxes is ignored. Thus, the relevant calculation is to divide the $8 annual dividend by the quantity of funds received from the issuance. In this case, the funds received equal $87 ($92 proceeds – $5 issue costs). Thus, the cost of capital is 9.2% ($8 / $87).
The management of Old Fenske Company (OFC) has been reviewing the company’s financing arrangements. The current financing mix is $750,000 of common stock, $200,000 of preferred stock ($50 par) and $300,000 of debt. OFC currently pays a common stock cash dividend of $2. The common stock sells for $38, and dividends have been growing at about 10% per year. Debt currently provides a yield to maturity to the investor of 12%, and preferred stock pays a dividend of 9% to yield 11%. Any new issue of securities will have a flotation cost of approximately 3%. OFC has retained earnings available for the equity requirement. The company’s effective income tax rate is 40%. Based on this information, the cost of capital for retained earnings is

A. 9.5%
B. 14.2%
C. 15.8%
D. 16.0%

- Answer (A) is incorrect because this percentage results from failing to consider the growth rate on dividends.
- Answer (B) is incorrect because this percentage results from failing to consider the next dividend.
- Answer (C) is correct. The cost of new common stock is the next dividend ($2.20) divided by the net proceeds of the stock. If this were to involve a new sale of stock, the flotation costs would be deducted from the selling price to get the net proceeds. However, this was for retained earnings, so there is no deduction. The calculation is to divide the $2.20 dividend by the $38 selling price to get 5.8%. Add the 10% growth rate and the answer is 15.8%.
- Answer (D) is incorrect because this percentage is based on an amount that erroneously deducted flotation costs from the selling price.

Pane Software, Inc., has total capital of $100 million, and its cost of capital is 12%. A new project has been proposed that will require additional capital of $10 million. The firm estimates that the additional capital can be raised at a pre-tax cost of 10%. The company’s marginal income tax rate is 36%. What discount rate should Pane use in evaluating the new project?

A. 6.40%
B. 7.56%
C. 10.00%
D. 11.82%

- Answer (A) is correct. The discount rate used in evaluating the new project should be the after-tax cost of the additional capital. Therefore, the discount rate to be used by Pane in evaluating its new project should be 6.40% [10% × (1 – .36)].
- Answer (B) is incorrect because the discount rate used in evaluating the new project should be the after-tax cost of the additional capital. This answer choice incorrectly adds the average of the current cost of capital and the additional cost of capital (11%) to the new cost of capital (10%) in order to get a pre-tax rate of 21%. This number is then incorrectly multiplied by the tax rate instead of 1 minus the tax rate.
- Answer (C) is incorrect because the discount rate used in evaluating the new project should be the after-tax cost of the additional capital. The amount of 10.00% fails to account for the effects of the tax rate.
- Answer (D) is incorrect because the amount of 11.82% is the average pre-tax cost of capital for all capital, both old and the additional capital.
Net working capital is the difference between

A. Current assets and current liabilities.
B. Fixed assets and fixed liabilities.
C. Total assets and total liabilities.
D. Shareholders’ investment and cash.

- Answer (A) is correct. Net working capital is defined by accountants as the difference between current assets and current liabilities. Working capital is a measure of short-term solvency.
- Answer (B) is incorrect because Working capital refers to the difference between current assets and current liabilities; fixed assets are not a component.
- Answer (C) is incorrect because Total assets and total liabilities are not components of working capital; only current items are included.
- Answer (D) is incorrect because Shareholders’ equity is not a component of working capital; only current items are included in the concept of working capital.

Determining the appropriate level of working capital for a firm requires

A. Changing the capital structure and dividend policy of the firm.
B. Maintaining short-term debt at the lowest possible level because it is generally more expensive than long-term debt.
C. Offsetting the benefit of current assets and current liabilities against the probability of technical insolvency.
D. Maintaining a high proportion of liquid assets to total assets in order to maximize the return on total investments.

- Answer (A) is incorrect because Capital structure and dividends relate to capital structure finance, not working capital finance.
- Answer (B) is incorrect because Short-term debt is usually less expensive than long-term debt.
- Answer (C) is correct. Working capital finance concerns the determination of the optimal level, mix, and use of current assets and current liabilities. The objective is to minimize the cost of maintaining liquidity while guarding against the possibility of technical insolvency. Technical insolvency is defined as the inability to pay debts as they come due.
- Answer (D) is incorrect because Liquid assets do not ordinarily earn high returns relative to long-term assets, so holding the former will not maximize the return on total assets.

Determining the appropriate level of working capital for a firm requires

A. Evaluating the risks associated with various levels of fixed assets and the types of debt used to finance these assets.
B. Changing the capital structure and dividend policy for the firm.
C. Maintaining short-term debt at the lowest possible level because it is ordinarily more expensive than long-term debt.
D. Offsetting the profitability of current assets and current liabilities against the probability of technical insolvency.

- Answer (A) is incorrect because Management of fixed assets is not a factor in working capital management.
- Answer (B) is incorrect because Capital structure and dividend policy are factors involved in capital structure finance, not in working capital financial management.
- Answer (C) is incorrect because Short-term debt is usually less expensive than long-term debt.
Answer (D) is correct. A company must maintain a level of working capital sufficient to pay bills as they come due. Failure to do so is technical insolvency and can result in involuntary bankruptcy. Unfortunately, holding current assets for purposes of paying bills is not profitable for a company because they usually offer a low return compared with longer-term investments. Thus, the skillful management of working capital requires a balancing of a firm’s desire for profit with its need for adequate liquidity.

All of the following statements in regard to working capital are true except

A. Current liabilities are an important source of financing for many small firms.
B. Profitability varies inversely with liquidity.
C. The hedging approach to financing involves matching maturities of debt with specific financing needs.
D. Financing permanent inventory buildup with long-term debt is an example of an aggressive working capital policy.

- Answer (A) is incorrect because Current liabilities, e.g., trade credit, is a major source of funds for small firms.
- Answer (B) is incorrect because Liquid investments tend to have low returns.
- Answer (C) is incorrect because Matching of asset and liability maturities is a moderate policy that minimizes risk. The expectation is that cash flows from the assets will be available to meet obligations for the liabilities.
- Answer (D) is correct. Financing permanent inventory buildup, which is essentially a long-term investment, with long-term debt is a moderate or conservative working capital policy. An aggressive policy involves using short-term, relatively low-cost debt to finance the inventory buildup. It focuses on high profitability potential, despite high risk and low liquidity. An aggressive policy involves reducing liquidity and accepting a higher risk of short-term lack of liquidity. Financing inventory with long-term debt increases the current ratio and accepts higher borrowing costs in exchange for greater liquidity and lower risk.

During the year, Mason Company’s current assets increased by $120,000, current liabilities decreased by $50,000, and net working capital

A. Increased by $70,000.
B. Did not change.
C. Decreased by $170,000.
D. Increased by $170,000.

- Answer (A) is incorrect because Both the increase in current assets and the decrease in current liabilities increase working capital.
- Answer (B) is incorrect because Net working capital did change.
- Answer (C) is incorrect because Net working capital increased.
- Answer (D) is correct. Net working capital is the excess of current assets over current liabilities. An increase in current assets or a decrease in current liabilities increases working capital. Thus, net working capital increased by $170,000 ($120,000 + $50,000).
Mason Company’s board of directors has determined 4 options to increase working capital next year. Option 1 is to increase current assets by $120 and decrease current liabilities by $50. Option 2 is to increase current assets by $180 and increase current liabilities by $30. Option 3 is to decrease current assets by $140 and increase current liabilities by $20. Option 4 is to decrease current assets by $100 and decrease current liabilities by $75. Which option should Mason choose to maximize net working capital?

A. Option 1.
B. Option 2.
C. Option 3.
D. Option 4.

- Answer (A) is correct. Net working capital is the excess of current assets over current liabilities. An increase in current assets or a decrease in current liabilities will increase net working capital. Option 1 maximizes Mason Company’s net working capital, increasing it by $170 ($120 + $50).
- Answer (B) is incorrect because Option 2 increases net working capital by $150.
- Answer (C) is incorrect because Option 3 decreases net working capital by $160.
- Answer (D) is incorrect because Option 4 decreases net working capital by $25.

Since Marsh, Inc., is experiencing a sharp increase in sales activity and a steady increase in production, the management of Marsh has adopted an aggressive working capital policy. Therefore, the company’s current level of net working capital

A. Would most likely be the same as in any other type of business condition as business cycles tend to balance out over time.
B. Would most likely be lower than under other business conditions in order that the company can maximize profits while minimizing working capital investment.
C. Would most likely be higher than under other business conditions so that there will be sufficient funds to replenish assets.
D. Would most likely be higher than under other business conditions as the company’s profits are increasing.

- Answer (A) is incorrect because The growing firm is more apt to emphasize production rather than protecting against technical insolvency by maintaining a high level of working capital.
- Answer (B) is correct. When a firm has an aggressive working capital policy, management keeps the investment in working capital at a minimum. Thus, a growing company would want to invest its funds in capital goods and not in idle assets. This policy maximizes return on investment at the price of the risk of minimal liquidity.
- Answer (C) is incorrect because The company will prefer to expend funds on capital goods.
- Answer (D) is incorrect because The company needs its profits to invest in new production equipment in order to grow.

As a company becomes more conservative in its working capital policy, it would tend to have a(n)

A. Decrease in its acid test ratio.
B. Increase in the ratio of current liabilities to noncurrent liabilities.
C. Increase in the ratio of current assets to units of output.
D. Increase in funds invested in common stock and a decrease in funds invested in marketable securities.

- Answer (A) is incorrect because A decrease in the acid test ratio suggests an aggressive policy. A conservative company wants a higher acid test ratio, that is, more liquid assets relative to liabilities.
- Answer (B) is incorrect because A conservative company wants working capital to be financed from long-term sources.
Answer (C) is **correct**. A conservative working capital policy minimizes liquidity risk by increasing net working capital (current assets – current liabilities). The result is that the company forgoes the potentially higher returns available from using the additional working capital to acquire long-term assets. A conservative working capital policy is characterized by a higher current ratio (current assets ÷ current liabilities) and acid test ratio (quick assets ÷ current liabilities). Thus, the company will increase current assets or decrease current liabilities. A conservative policy finances assets using long-term or permanent funds rather than short-term sources.

Answer (D) is incorrect because a conservative company seeks more liquid (marketable) investments.

As a company becomes more conservative with respect to working capital policy, it would tend to have a(n)

A. Increase in the ratio of current liabilities to noncurrent liabilities.
B. Decrease in the operating cycle.
C. Decrease in the quick ratio.
D. Increase in the ratio of current assets to noncurrent assets.

- Answer (A) is incorrect because an increase in current liabilities relative to noncurrent liabilities would increase liquidity risk.
- Answer (B) is incorrect because a decrease in the normal operating cycle permits a lower level of working capital. If assets can be converted to cash more quickly, current assets can be reduced.
- Answer (C) is incorrect because a decrease in the quick ratio signifies that quick assets (cash, receivables, and marketable securities) are decreasing relative to current liabilities.
- Answer (D) is **correct**. A conservative working capital policy results in an increase in working capital (current assets – current liabilities). It is typified by a reduction in liquidity risk. Increasing the current ratio, whether by decreasing current liabilities or increasing current assets, minimizes the risk that the company will not be able to meet its obligations as they fall due. Thus, an increasing ratio of current to noncurrent assets means that a company is forgoing the potentially higher returns on long-term assets in order to guard against short-term cash flow problems.

Starrs Company has current assets of $400,000 and current liabilities of $300,000. Starrs could increase its net working capital by the

A. Prepayment of $50,000 of next year’s rent.
B. Refinancing of $50,000 of short-term debt with long-term debt.
C. Acquisition of land valued at $50,000 through the issuance of common stock.
D. Purchase of $50,000 of trading securities for cash.

- Answer (A) is incorrect because a prepayment of expenses does not change current assets or current liabilities. Cash decreases by the same amount that prepaid rent increases.
- Answer (B) is **correct**. Net working capital is defined as the excess of current assets over current liabilities. Refinancing short-term debt with long-term debt decreases current liabilities with no effect on current assets, resulting in an increase in working capital.
- Answer (C) is incorrect because the acquisition of land (a noncurrent asset) for common stock (an equity interest) does not affect either current assets or current liabilities.
- Answer (D) is incorrect because the purchase of trading securities does not affect total current assets. Cash is replaced by trading securities, another current asset.
The Herb Salter Corporation is considering a plant expansion that will increase its sales and net income. The following data represent management’s estimate of the impact the proposal will have on the company:

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$120,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>360,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>400,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>360,000</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>180,000</td>
</tr>
<tr>
<td>Mortgage payable (current)</td>
<td>160,000</td>
</tr>
<tr>
<td>Fixed assets</td>
<td>2,300,000</td>
</tr>
<tr>
<td>Net income</td>
<td>400,000</td>
</tr>
</tbody>
</table>

The effect of the plant expansion on Salter’s net working capital will be a(n)

A. Increase of $240,000.
B. Decrease of $10,000.
C. Increase of $230,000.
D. Increase of $10,000.

- Answer (A) is incorrect because the increase in current liabilities is $240,000.
- Answer (B) is correct. Net working capital is defined as current assets minus current liabilities. Net working capital is calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$120,000</td>
<td>$140,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>400,000</td>
<td>550,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>360,000</td>
<td>420,000</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>180,000</td>
<td>180,000</td>
</tr>
<tr>
<td>Total current assets</td>
<td>$1,060,000</td>
<td>$1,290,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$360,000</td>
<td>$450,000</td>
</tr>
<tr>
<td>Mortgage payable -- current</td>
<td>160,000</td>
<td>310,000</td>
</tr>
<tr>
<td>Total current liabilities</td>
<td>$ (520,000)</td>
<td>$ (760,000)</td>
</tr>
<tr>
<td>Working capital</td>
<td>$540,000</td>
<td>$530,000</td>
</tr>
</tbody>
</table>

Net working capital decreases by $10,000 from the current $540,000 to $530,000 under the proposal.

- Answer (C) is incorrect because the proposed increase in current assets is $230,000.
- Answer (D) is incorrect because Working capital would decrease.

Which one of the following would increase the net working capital of a firm?

A. Cash payment of payroll taxes payable.
B. Purchase of a new plant financed by a 20-year mortgage.
C. Cash collection of accounts receivable.
D. Refinancing a short-term note payable with a 2-year note payable.

- Answer (A) is incorrect because a cash payment of payroll taxes decreases current assets and current liabilities by equal amounts.
- Answer (B) is incorrect because buying a new plant with a 20-year mortgage has no effect on current assets or current liabilities.
Answer (C) is incorrect because Cash collection of an account receivable increases one current asset and decreases another by the same amount.

Answer (D) is correct. Net working capital equals current assets minus current liabilities. Refinancing a short-term note with a 2-year note payable decreases current liabilities, thus increasing working capital.

If a firm increases its cash balance by issuing additional shares of common stock, net working capital

A. Remains unchanged and the current ratio remains unchanged.
B. Increases and the current ratio remains unchanged.
C. Increases and the current ratio decreases.
D. Increases and the current ratio increases.

Answer (A) is incorrect because Both working capital and the current ratio increase.

Answer (B) is incorrect because Both working capital and the current ratio increase.

Answer (C) is incorrect because Both working capital and the current ratio increase.

Answer (D) is correct. Net working capital is the excess of current assets over current liabilities. The current ratio equals current assets divided by current liabilities. Selling stock for cash increases current assets and stockholders’ equity, with no effect on current liabilities. The result is an increase in working capital and the current ratio.

The working capital financing policy that subjects the firm to the greatest risk of being unable to meet the firm’s maturing obligations is the policy that finances

A. Fluctuating current assets with long-term debt.
B. Permanent current assets with long-term debt.
C. Permanent current assets with short-term debt.
D. Fluctuating current assets with short-term debt.

Answer (A) is incorrect because It is not particularly risky to finance working capital needs from long-term debt sources.

Answer (B) is incorrect because It is not particularly risky to finance working capital needs from long-term debt sources.

Answer (C) is correct. Fluctuating current assets can often be financed with short-term debt because the periodic liquidation of the assets provides funds to pay off the debt. However, financing permanent current assets with short-term debt is a risky strategy because the assets may not be liquidated in time to pay off the debt at maturity.

Answer (D) is incorrect because Financing fluctuating current assets with short-term debt is not as risky as financing permanent current assets with short-term debt.

Clay Corporation follows an aggressive financing policy in its working capital management while Lott Corporation follows a conservative financing policy. Which one of the following statements is correct?

A. Clay has a low ratio of short-term debt to total debt while Lott has a high ratio of short-term debt to total debt.
B. Clay has a low current ratio while Lott has a high current ratio.
C. Clay has less liquidity risk while Lott has more liquidity risk.
D. Clay’s interest charges are lower than Lott’s interest charges.

Answer (A) is incorrect because Clay’s aggressive policy would result in more short-term debt, with attendant renewal problems and high risk. Lott’s conservative policy would produce more long-term debt or equity financing.
Answer (B) is correct. A conservative working capital management financing policy uses permanent capital to finance permanent asset requirements and also some or all of the firm’s seasonal demands. Thus, Lott’s current ratio (current assets/current liabilities) will be high since its current liabilities will be relatively low. An aggressive policy entails financing some fixed assets and all the current assets with short-term capital. This policy results in a lower current ratio.

Answer (C) is incorrect because Clay is subject to greater liquidity risk than Lott since it has greater short-term debt. Hence, it is at greater risk of being unable to meet its maturing obligations.

Answer (D) is incorrect because A more conservative company would tend to finance by means of equity rather than debt capital. Thus, the more conservative company would have less interest expense.

Shown below are selected data from Fortune Company’s most recent financial statements.

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketable securities</td>
<td>10,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>60,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>25,000</td>
</tr>
<tr>
<td>Supplies</td>
<td>5,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>40,000</td>
</tr>
<tr>
<td>Short-term debt payable</td>
<td>10,000</td>
</tr>
<tr>
<td>Accruals</td>
<td>5,000</td>
</tr>
</tbody>
</table>

What is Fortune’s net working capital?

A. $35,000  
B. $45,000  
C. $50,000  
D. $80,000

Answer (A) is incorrect because The amount of $35,000 results from failing to include marketable securities in current assets.

Answer (B) is correct. Working capital equals current assets minus current liabilities. Assuming the accruals are for expenses, Fortune Company’s calculation is as follows:

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketable securities</td>
<td>10,000</td>
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<td>25,000</td>
</tr>
<tr>
<td>Supplies</td>
<td>5,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>(40,000)</td>
</tr>
<tr>
<td>Short-term debt payable</td>
<td>(10,000)</td>
</tr>
<tr>
<td>Accruals</td>
<td>(5,000)</td>
</tr>
<tr>
<td>Working capital</td>
<td>$45,000</td>
</tr>
</tbody>
</table>

Answer (C) is incorrect because The amount of $50,000 results from failing to include accruals in current liabilities.

Answer (D) is incorrect because The amount of $80,000 results from failing to include supplies in current assets and accounts payable in current liabilities.
Of the following, the working capital financing policy that would subject a firm to the greatest level of risk is the one where the firm finances

A. Fluctuating current assets with short-term debt.
B. Permanent current assets with long-term debt.
C. Fluctuating current assets with long-term debt.
D. Permanent current assets with short-term debt.

- Answer (A) is incorrect because The risk of lack of liquidity is reduced when short-term debt is used to finance fluctuating current assets.
- Answer (B) is incorrect because Financing permanent working capital with long-term debt minimizes the risks that (1) assets may not be liquidated in time to pay the debts, (2) interest rates will increase, and (3) loans will not be renewed.
- Answer (C) is incorrect because The default risk of financing fluctuating current assets with long-term debt is lower than for financing permanent current assets with short-term debt. But the cost of long-term debt tends to be higher than the cost of short-term debt.
- Answer (D) is correct. The maturity matching (self-liquidating) approach to financing of current assets minimizes the risk that the entity cannot pay its debts when they become due. It is based on the assumption that the firm can control when the assets are liquidated. Accordingly, the riskiest approach is to finance permanent assets with short-term debt. Moreover, short-term financing subjects the firm to greater risks of interest rate increases and loan renewal problems.

Average daily cash outflows are $3 million for Evans, Inc. A new cash management system can add 2 days to the disbursement schedule. Assuming Evans earns 10% on excess funds, how much should the firm be willing to pay per year for this cash management system?

A. $6,000,000
B. $3,000,000
C. $1,500,000
D. $600,000

- Answer (A) is incorrect because The amount of $6 million is the increase in cash, not the interest earned on that additional cash.
- Answer (B) is incorrect because The amount of $3 million is the amount of daily payments, not the savings.
- Answer (C) is incorrect because The daily payments should be multiplied by two, not divided by two.
- Answer (D) is correct. If cash outflows are $3 million per day, holding cash 2 extra days means that average balances should increase by $6 million. At a 10% interest rate, the additional $6 million would generate interest revenue of $600,000 per year. Thus, if the system can be acquired for $600,000 or less, it would be beneficial to do so.

According to John Maynard Keynes, the three major motives for holding cash are for

A. Transactional, psychological, and social purposes.
B. Speculative, fiduciary, and transactional purposes.
C. Speculative, social, and precautionary purposes.
D. Transactional, precautionary, and speculative purposes.

- Answer (A) is incorrect because These are not the three major motives for holding cash according to Keynesian economics.
- Answer (B) is incorrect because These are not the three major motives for holding cash according to Keynesian economics.
Answer (C) is incorrect because these are not the three major motives for holding cash according to Keynesian economics.

Answer (D) is correct. John Maynard Keynes, founder of Keynesian economics, concluded that there were three major motives for holding cash: for transactional purposes as a medium of exchange, precautionary purposes, and speculative purposes (but only during deflationary periods).

[607] A consultant recommends that a company hold funds for the following two reasons:

Reason #1: Cash needs can fluctuate substantially throughout the year.
Reason #2: Opportunities for buying at a discount may appear during the year.

The cash balances used to address the reasons given above are correctly classified as

<table>
<thead>
<tr>
<th>Reason #1</th>
<th>Reason #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speculative</td>
<td>Speculative</td>
</tr>
<tr>
<td>Speculative</td>
<td>Precautionary</td>
</tr>
<tr>
<td>Precautionary</td>
<td>Speculative</td>
</tr>
<tr>
<td>Precautionary</td>
<td>Precautionary</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Reason #1 is fulfilled by precautionary balances.
- Answer (B) is incorrect because this combination results from reversing the correct balances.
- Answer (C) is correct. The three motives for holding cash are as a medium of exchange, as a precautionary measure, and for speculation. Reason #1 can be classified as a precautionary measure, and Reason #2 can be classified as holding cash for speculation.
- Answer (D) is incorrect because Reason #2 is fulfilled by speculative balances.

[608] All of the following are valid reasons for a business to hold cash and marketable securities except to

A. Satisfy compensating balance requirements.
B. Maintain adequate cash needed for transactions.
C. Meet future needs.
D. Earn maximum returns on investment assets.

- Answer (A) is incorrect because if a firm is party to a compensating balance agreement, cash must be held.
- Answer (B) is incorrect because the transactional motive is one of the three Keynesian reasons for holding cash.
- Answer (C) is incorrect because meeting future needs is a valid reason to hold cash.
- Answer (D) is correct. A company will hold cash and marketable securities to facilitate business transactions; cash is a medium of exchange. Cash and near-cash items are also held to meet future needs, to satisfy compensating balance requirements imposed by lenders, and to provide a precautionary balance for security purposes. Cash is usually not held in an attempt to earn maximum returns on investment because cash and marketable securities are not usually the highest paying investments.
A firm uses the following model to determine the optimal level of cash balance (Q):

\[
Q = \sqrt{\frac{2bT}{i}}
\]

Where: 
- \(b\) = fixed cost per transaction
- \(T\) = total demand for cash over a period of time
- \(i\) = interest rate on marketable securities

This formula is a modification of the economic order quantity (EOQ) formula used for inventory management. Assume that the fixed cost of selling marketable securities is $10 per transaction and the interest rate on marketable securities is 6% per year. The company estimates that it will make cash payments of $12,000 over a 1-month period. What is the average cash balance (rounded to the nearest dollar)?

A. $1,000  
B. $2,000  
C. $3,464  
D. $6,928

- **Answer (A) is incorrect** because the amount of $1,000 results from using 24%, rather than 6%, in the denominator.  
- **Answer (B) is incorrect** because the amount of $2,000 results from using 6%, rather than 0.5%, in the denominator.  
- **Answer (C) is correct**. The EOQ for inventory is a function of ordering cost per order, inventory demand, and carrying cost. In the cash model, the fixed cost per sale of securities is equivalent to the ordering cost, the demand for cash is similar to the demand for inventory, and the interest rate is effectively the cost of carrying a dollar of cash for the period. The formula can be used to determine the optimal level of cash:

\[
Q = \sqrt{\frac{2 \times $10 \times $12,000}{0.06 \div 12 \text{ months}}} = \sqrt{\frac{$240,000}{.005}} = $6,928
\]

Thus, the average cash balance is $3,464 ($6,928 ÷ 2).

- **Answer (D) is incorrect** because the amount of $6,928 is the optimal, not the average, cash balance.

Some managers express the opinion that their “cash management problems are nothing more than inventory problems.” They then proceed to use cash management models, such as the EOQ model, to determine the

A. Credit and collection policies.  
B. Marketable securities level.  
C. Proper relationship between current assets and current liabilities.  
D. Proper blend of marketable securities and cash.

- **Answer (A) is incorrect** because credit and collection policies concern receivables and are not influenced by an EOQ model for inventory management.  
- **Answer (B) is incorrect** because the level of marketable securities is in part determined by cash needs.  
- **Answer (C) is incorrect** because the relationship between current assets and current liabilities concerns many factors other than cash management.
Answer (D) is correct. Because cash and inventory are both nonearning assets, in principle they may be treated similarly. The alternative to holding cash, however, is to hold marketable securities that do earn interest or dividends. Thus, a cash management model would determine how much of a firm’s liquidity should be held as cash and how much in the form of marketable securities.

[611] The economic order quantity (EOQ) formula can be adapted in order for a firm to determine the optimal split between cash and marketable securities. The EOQ model assumes all of the following except that

A. The cost of a transaction is independent of the dollar amount of the transaction.
B. Interest rates are constant over the short run.
C. There is an opportunity cost associated with holding cash, beginning with the first dollar.
D. Cash flow requirements are random.

- Answer (A) is incorrect because Use of the EOQ model assumes that the cost of a transaction is independent of the dollar amount of the transaction.
- Answer (B) is incorrect because Use of the EOQ model assumes that interest rates are constant over the short run.
- Answer (C) is incorrect because Use of the EOQ model assumes that there is an opportunity cost associated with holding cash, beginning with the first dollar.
- Answer (D) is correct. The EOQ formula is a deterministic model that requires a known demand for inventory or, in this case, the amount of cash needed. Thus, the cash flow requirements cannot be random. The model also assumes a given carrying (interest) cost and a flat transaction cost for converting marketable securities to cash, regardless of the amount withdrawn.

[612] Determining the amount and timing of conversions of marketable securities to cash is a critical element of a financial manager’s performance. In terms of the rate of return forgone on converted securities and the cost of such transactions, the optimal amount of cash to be raised by selling securities is

A. Inversely related to the rate of return forgone and directly related to the cost of the transaction.
B. Directly related to the rate of return forgone and directly related to the cost of the transaction.
C. Directly related to the rate of return forgone and inversely related to the cost of the transaction.
D. Inversely related to the rate of return forgone and inversely related to the cost of the transaction.

- Answer (A) is correct. The optimal amount of cash to be raised by selling securities is calculated by a formula similar to that used to determine the economic order quantity for inventory.

\[
\text{Cash to be raised} = \sqrt{\frac{2FT}{k}}
\]

Where: 
- \(T\) = Total cash needed for the period
- \(F\) = Cost of making a securities trade
- \(k\) = Opportunity cost of holding cash

The optimal amount of cash to be raised by selling securities is inversely related to the rate of return forgone (opportunity and directly related to the cost of the transaction.

- Answer (B) is incorrect because A high (low) opportunity cost results in a lower (higher) optimal cash balance, whereas high (low) transaction costs result in a higher (lower) optimal cash balance.
- Answer (C) is incorrect because A high (low) opportunity cost results in a lower (higher) optimal cash balance, whereas high (low) transaction costs result in a higher (lower) optimal cash balance.
Answer (D) is incorrect because a high (low) opportunity cost results in a lower (higher) optimal cash balance, whereas high (low) transaction costs result in a higher (lower) optimal cash balance.

The most direct way to prepare a cash budget for a manufacturing firm is to include:

A. Projected sales, credit terms, and net income.
B. Projected net income, depreciation, and goodwill impairment.
C. Projected purchases, percentages of purchases paid, and net income.
D. Projected sales and purchases, percentages of collections, and terms of payments.

Answer (A) is incorrect because net income is an accrual-basis number.
Answer (B) is incorrect because net income, goodwill impairment, and depreciation are accrual-basis amounts.
Answer (C) is incorrect because collection percentages must be considered, and net income includes noncash elements.
Answer (D) is correct. The most direct way of preparing a cash budget requires incorporation of sales projections and credit terms, collection percentages, estimated purchases and payment terms, and other cash receipts and disbursements. In other words, preparation of the cash budget requires consideration of both inflows and outflows.

Shown below is a forecast of sales for Cooper Inc., for the first 4 months of the year (all amounts are in thousands of dollars).

<table>
<thead>
<tr>
<th></th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash sales</td>
<td>$ 15</td>
<td>$ 24</td>
<td>$18</td>
<td>$14</td>
</tr>
<tr>
<td>Sales on credit</td>
<td>100</td>
<td>120</td>
<td>90</td>
<td>70</td>
</tr>
</tbody>
</table>

On average, 50% of credit sales are paid for in the month of sale, 30% in the month following the sale, and the remainder is paid 2 months after the month of sale. Assuming there are no bad debts, the expected cash inflow for Cooper in March is

A. $138,000
B. $122,000
C. $119,000
D. $108,000

Answer (A) is incorrect because the amount of $138,000 equals the sum of February credit sales and March cash sales.
Answer (B) is incorrect because the amount of $122,000 equals 50% of January credit sales, 30% of February credit sales, 20% of March credit sales, and 100% of March cash sales.
Answer (C) is correct. Cash inflows for March would consist of 50% of March credit sales ($90 \times 50\% = $45), plus 30% of February credit sales ($120 \times 30\% = $36), plus 20% of January credit sales ($100 \times 20\% = $20), plus cash sales for March of $18. Consequently, total collections equal $119,000.
Answer (D) is incorrect because the amount of $108,000 is the total sales for March, not the total cash collections for March.
The following information applies to Brandon Company:

<table>
<thead>
<tr>
<th></th>
<th>Purchases</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$160,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>February</td>
<td>160,000</td>
<td>200,000</td>
</tr>
<tr>
<td>March</td>
<td>160,000</td>
<td>240,000</td>
</tr>
<tr>
<td>April</td>
<td>140,000</td>
<td>300,000</td>
</tr>
<tr>
<td>May</td>
<td>140,000</td>
<td>260,000</td>
</tr>
<tr>
<td>June</td>
<td>120,000</td>
<td>240,000</td>
</tr>
</tbody>
</table>

A cash payment equal to 40% of purchases is made at the time of purchase, and 30% is paid in each of the next 2 months. Purchases for the previous November and December were $150,000 per month. Payroll is 10% of sales in the month it occurs, and operating expenses are 20% of the following month’s sales (July sales were $220,000). Interest payments were $20,000 paid quarterly in January and April. Brandon’s cash disbursements for the month of April were:

A. $140,000
B. $152,000
C. $200,000
D. $254,000

- Answer (A) is incorrect because the disbursements for the month are greater than the purchases for the month.
- Answer (B) is incorrect because the amount of $152,000 excludes operating expenses, payroll, and interest.
- Answer (C) is incorrect because the amount of $200,000 is based on a miscalculation of operating expenses and payroll.
- Answer (D) is correct. Brandon’s cash disbursements for the month of April are calculated as follows:

- April purchases: $140,000 × 40% = $56,000
- March purchases: $160,000 × 30% = 48,000
- February purchases: $160,000 × 30% = 48,000
- April payroll: $300,000 × 10% = 30,000
- April op. expenses: $260,000 × 20% = 52,000
- Interest = 20,000
- Total April disbursements = $254,000
The following information applies to Oxford Company:

<table>
<thead>
<tr>
<th></th>
<th>Purchases</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$150,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>February</td>
<td>150,000</td>
<td>200,000</td>
</tr>
<tr>
<td>March</td>
<td>150,000</td>
<td>250,000</td>
</tr>
<tr>
<td>April</td>
<td>130,000</td>
<td>250,000</td>
</tr>
<tr>
<td>May</td>
<td>130,000</td>
<td>300,000</td>
</tr>
<tr>
<td>June</td>
<td>100,000</td>
<td>230,000</td>
</tr>
</tbody>
</table>

A cash payment equal to 50% of purchases is made at the time of purchase, and 25% is paid in each of the next 2 months. Purchases for the previous November and December were $140,000 per month. Payroll for a month is 10% of that month’s sales, and other operating expenses are 15% of the following month’s sales (July sales were $210,000). Interest payments were $25,000 paid quarterly in January and April. Oxford’s cash disbursements for the month of April were:

- Answer (A) is incorrect because the purchases for the month equal $130,000.
- Answer (B) is incorrect because the amount of $140,000 excludes other operating expenses, payroll, and interest.
- Answer (C) is incorrect because the amount of $210,000 excludes the $25,000 interest payment.
- Answer (D) is correct. Oxford’s cash disbursements for the month of April are calculated as follows:

<table>
<thead>
<tr>
<th>Disbursement Type</th>
<th>Calculation</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>April purchases</td>
<td>$130,000 × 50%</td>
<td>$65,000</td>
</tr>
<tr>
<td>March purchases</td>
<td>150,000 × 25%</td>
<td>$37,500</td>
</tr>
<tr>
<td>February purchases</td>
<td>150,000 × 25%</td>
<td>$37,500</td>
</tr>
<tr>
<td>April payroll</td>
<td>250,000 × 10%</td>
<td>$25,000</td>
</tr>
<tr>
<td>April op. expenses</td>
<td>300,000 × 15%</td>
<td>$45,000</td>
</tr>
<tr>
<td>Interest</td>
<td></td>
<td>$25,000</td>
</tr>
<tr>
<td>Total April disbursements</td>
<td></td>
<td>$235,000</td>
</tr>
</tbody>
</table>

What is the benefit for a firm with daily cash receipts of $15,000 to be able to speed up collections by 2 days, assuming an 8% annual return on short-term investments and no cost to the company to speed up collections?

- Answer (A) is incorrect because this figure is the annual, not the daily, benefit.
- Answer (B) is correct. Speeding up collections by 2 days will raise the firm’s average cash balance by $30,000. At 8% interest, the benefit will be $2,400 annually (($15,000 × 2 days) × .08).
- Answer (C) is incorrect because this figure is the amount of daily cash receipts.
- Answer (D) is incorrect because this figure is the reduction in receivables.
[618] DLF is a retail mail order firm that currently uses a central collection system that requires all checks to be sent to its Boston headquarters. An average of 6 days is required for mailed checks to be received, 3 days for DLF to process them, and 2 days for the checks to clear through its bank. A proposed lockbox system would reduce the mailing and processing time to 2 days and the check clearing time to 1 day. DLF has an average daily collection of $150,000. If DLF adopts the lockbox system, its average cash balance will increase by

A. $1,200,000  
B. $750,000  
C. $600,000  
D. $450,000

- Answer (A) is correct. Checks are currently tied up for 11 days (6 for mailing, 3 for processing, and 2 for clearing). If that period were reduced to 3 days, DLF’s cash balance would increase by $1,200,000 ($150,000 per day × 8 days).
- Answer (B) is incorrect because the decrease is 8 days, not 5.
- Answer (C) is incorrect because the amount of $600,000 represents only a 4-day savings.
- Answer (D) is incorrect because the lockbox system will result in an additional 8 days of savings, not 3.

[619] A lockbox system

A. Reduces the need for compensating balances.  
B. Provides security for late night deposits.  
C. Reduces the risk of having checks lost in the mail.  
D. Accelerates the inflow of funds.

- Answer (A) is incorrect because a lockbox system is not related to compensating balances; a compensating balance may be required by a covenant in a loan agreement that requires a company to maintain a specified balance during the term of the loan.
- Answer (B) is incorrect because a lockbox system is a process by which payments are sent to a bank’s mailbox, which is checked during normal post office hours.
- Answer (C) is incorrect because the use of a lockbox system entails sending checks through the mail to a post office box. Thus, it does not reduce the risk of losing checks in the mail.
- Answer (D) is correct. A lockbox system is one strategy for expediting the receipt of funds. Customers submit their payments to a mailbox controlled by the bank rather than to the company’s offices. Bank personnel remove the envelopes from the mailbox and deposit the checks to the company’s account immediately. The remittance advice must then be transported to the company for entry into the accounts receivable system. The bank generally charges a flat monthly fee for this service.

[620] A firm has daily cash receipts of $100,000 and collection time of 2 days. A bank has offered to reduce the collection time on the firm’s deposits by 2 days for a monthly fee of $500. If money market rates are expected to average 6% during the year, the net annual benefit (loss) from having this service is

A. $3,000  
B. $12,000  
C. $0  
D. $6,000

- Answer (A) is incorrect because this figure results from miscalculating the annual interest revenue.
- Answer (B) is incorrect because this figure results from failing to subtract the annual service charge.
• Answer (C) is incorrect because this figure results from subtracting the interest earned from the cost.
• Answer (D) is correct. The additional annual income (loss) from using the bank’s proposed service is the excess (deficit) of interest earned on the early deposits over (under) the cost of the service. If the plan is adopted, the firm’s average cash balance will increase by $200,000 ($100,000 \times 2 \text{ days})$.

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost}
\]
\[
= ($200,000 \times 6\%) - ($500 \times 12 \text{ months})
\]
\[
= $12,000 - $6,000
\]
\[
= $6,000
\]

[621] A firm has daily cash receipts of $200,000. A commercial bank has offered to reduce the collection time by 3 days. The bank requires a monthly fee of $4,000 for providing this service. If money market rates will average 12% during the year, the additional annual income (loss) of having the service is

A. $(24,000)$
B. $24,000$
C. $66,240$
D. $68,000$

• Answer (A) is incorrect because this figure results from subtracting the interest earned from the cost.
• Answer (B) is correct. The additional annual income (loss) from using the bank’s proposed service is the excess (deficit) of interest earned on the early deposits over (under) the cost of the service. If the plan is adopted, the firm’s average cash balance will increase by $600,000 ($200,000 \times 3 \text{ days})$.

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost}
\]
\[
= ($600,000 \times 12\%) - ($4,000 \times 12 \text{ months})
\]
\[
= $72,000 - $48,000
\]
\[
= $24,000
\]

• Answer (C) is incorrect because this figure is a nonsense number.
• Answer (D) is incorrect because this figure results from subtracting the service charge for only a single month.

[622] A firm has daily cash receipts of $300,000. A bank has offered to provide a lockbox service that will reduce the collection time by 3 days. The bank requires a monthly fee of $2,000 for providing this service. If money market rates are expected to average 6% during the year, the additional annual income (loss) of using the lockbox service is

A. $(24,000)$
B. $12,000$
C. $30,000$
D. $54,000$

• Answer (A) is incorrect because this figure results from ignoring the additional interest revenue from investing the increased funds.
• Answer (B) is incorrect because this figure is based on 2 days of accelerated inflows rather than 3.
Answer (C) is correct. The additional annual income (loss) from using the lockbox service is the excess (deficit) of interest earned on the early deposits over (under) the cost of the service. If the plan is adopted, the firm’s average cash balance will increase by $900,000 ($300,000 × 3 days).

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost} \\
= (\$900,000 \times 6\%) - (\$2,000 \times 12 \text{ months}) \\
= \$54,000 - \$24,000 \\
= \$30,000
\]

Answer (D) is incorrect because this figure results from failing to subtract the annual service charge.

[623] A firm has daily cash receipts of $300,000. A commercial bank has offered to reduce the collection time by 2 days. The bank requires a monthly fee of $3,000 for providing this service. If the money market rates will average 11% during the year, the annual pretax income (loss) from using the service is

A. $(30,000) \\
B. $30,000 \\
C. $66,000 \\
D. $63,000

Answer (A) is incorrect because this figure results from subtracting the interest earned from the cost. 
Answer (B) is correct. The additional annual income (loss) from using the bank’s proposed service is the excess (deficit) of interest earned on the early deposits over (under) the cost of the service. If the plan is adopted, the firm’s average cash balance will increase by $600,000 ($300,000 × 2 days).

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost} \\
= (\$600,000 \times 11\%) - (\$3,000 \times 12 \text{ months}) \\
= \$66,000 - \$36,000 \\
= \$30,000
\]

Answer (C) is incorrect because this figure results from failing to subtract the $36,000 cost of the service. 
Answer (D) is incorrect because this figure results from subtracting the service charge for only a single month.

[624] A firm has daily cash receipts of $300,000 and is interested in acquiring a lockbox service in order to reduce collection time. Bank 1’s lockbox service costs $3,000 per month and will reduce collection time by 3 days. Bank 2’s lockbox service costs $5,000 per month and will reduce collection time by 4 days. Bank 3’s lockbox service costs $500 per month and will reduce collection time by 1 day. Bank 4’s lockbox service costs $1,000 per month and will reduce collection time by 2 days. If money market rates are expected to average 6% during the year, and the firm wishes to maximize income, which bank should the firm choose?

A. Bank 1. \\
B. Bank 2. \\
C. Bank 3. \\
D. Bank 4.

Answer (A) is incorrect because Bank 1’s service will increase the firm’s income by only $18,000. 
Answer (B) is incorrect because Bank 2’s service will increase the firm’s income by only $12,000. 
Answer (C) is incorrect because Bank 3’s service will increase the firm’s income by only $12,000.
Answer (D) is correct. The additional annual income generated by Bank 4’s lockbox service can be calculated as follows:

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost} \\
= (300,000 \times 2 \text{ days} \times 6\%) - (1,000 \times 12 \text{ months}) \\
= 36,000 - 12,000 \\
= 24,000
\]

Newman Products has received proposals from several banks to establish a lockbox system to speed up receipts. Newman receives an average of 700 checks per day averaging $1,800 each, and its cost of short-term funds is 7% per year. Assuming that all proposals will produce equivalent processing results and using a 360-day year, which one of the following proposals is optimal for Newman?

A. A $0.50 fee per check.
B. A flat fee of $125,000 per year.
C. A fee of 0.03% of the amount collected.
D. A compensating balance of $1,750,000.

Answer (A) is incorrect because a $0.50 fee per check will result in an annual cost of $126,000.
Answer (B) is incorrect because an annual cost of $125,000 is not optimal.
Answer (C) is incorrect because a fee of 0.03% of the amount collected will result in an annual cost of $136,080.
Answer (D) is correct. Multiplying 700 checks times 360 days results in a total of 252,000 checks per year. Accordingly, using a $0.50 fee per check, total annual cost is $126,000 (252,000 \times $.50), which is less desirable than a $125,000 flat fee. Given that the annual collections equal $453,600,000 (700 checks \times $1,800 \times 360 days), a fee of 0.03% of the amount collected is also less desirable because the annual fee would be $136,080 ($453,600,000 \times .03\%). The best option is therefore to maintain a compensating balance of $1,750,000 when the cost of funds is 7%, resulting in a total cost of $122,500 ($1,750,000 \times 7\%).

Cleveland Masks and Costumes, Inc., (CMC) has a majority of its customers located in the states of California and Nevada. Keystone National Bank, a major west coast bank, has agreed to provide a lockbox system to CMC at a fixed fee of $50,000 per year and a variable fee of $0.50 for each payment processed by the bank. On average, CMC receives 50 payments per day, each averaging $20,000. With the lockbox system, the company’s collection float will decrease by 2 days. The annual interest rate on money market securities is 6%. If CMC makes use of the lockbox system, what would be the net benefit to the company? Use 365 days per year.

A. $59,125
B. $60,875
C. $50,000
D. $120,000

Answer (A) is incorrect because the annual lockbox cost is $59,125.
Answer (B) is correct. The annual benefit from using the lockbox system is the excess of interest earned on the early deposits over the cost of the service. If the plan is adopted, the firm’s average cash balance will increase by $2,000,000 ($20,000 average payment × 50 per day × 2 days). The annual variable cost will be $9,125 ($0.50 per payment × 50 per day × 365 days).

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost} \\
= (2,000,000 \times 6\%) - (50,000 + 9,125) \\
= 120,000 - 59,125 \\
= 60,875
\]

Answer (C) is incorrect because the annual fixed fee is $50,000.
Answer (D) is incorrect because the annual savings without regard to costs is $120,000.

[627] Troy Toys is a retailer operating in several cities. The individual store managers deposit daily collections at a local bank in a non-interest bearing checking account. Twice per week, the local bank issues a depositary transfer check (DTC) to the central bank at headquarters. The controller of the company is considering using a wire transfer instead. The additional cost of each transfer would be $25; collections would be accelerated by 2 days; and the annual interest rate paid by the central bank is 7.2% (0.02% per day). At what amount of dollars transferred would it be economically feasible to use a wire transfer instead of the DTC? Assume a 360-day year.

A. It would never be economically feasible.
B. $125,000 or above.
C. Any amount greater than $173.
D. Any amount greater than $62,500.

Answer (A) is incorrect because the $25 transfer fee is covered by the interest on $62,500 for 2 days.
Answer (B) is incorrect because the amount of $125,000 is required if collections are accelerated by only 1 day.
Answer (C) is incorrect because the interest on $173 for 2 days is less than $0.07.
Answer (D) is correct. To break even, the interest that Troy can earn on the early deposits must at least equal the wire transfer fee.

\[
\text{Interest earned} = \text{Cost} \\
\text{Transfer amount} \times 2 \text{ days} \times 0.02\% = 25 \\
\text{Transfer amount} \times 0.04\% = 25 \\
\text{Transfer amount} = 62,500
\]

[628] CMR is a retail mail order firm currently using a central collection system that requires all checks to be sent to its Boston headquarters. An average of 5 days is required for mailed checks to be received, 4 days for CMR to process them, and 1 1/2 days for the checks to clear through the bank. A proposed lockbox system would reduce the mail and process time to 3 days and the check clearing time to 1 day. CMR has an average daily collection of $100,000. If CMR should adopt the lockbox system, its average cash balance would increase by

A. $250,000
B. $400,000
C. $650,000
D. $800,000

Answer (A) is incorrect because this figure results from adding the old clearing time and the new clearing time.
Answer (B) is incorrect because this figure results from simply adding the new process time and the new clearing time.

Answer (C) is correct. Checks are currently tied up for 10 1/2 days (5 for mailing, 4 for processing, and 1 1/2 for clearing). If that were reduced to 4 days, CMR’s cash balance would increase by $650,000 ($100,000 per day × 6 1/2 days).

Answer (D) is incorrect because this figure results from simply adding the mail time and the new process time.

Foster, Inc., is considering implementing a lockbox collection system at a cost of $80,000 per year. Annual sales are $90 million, and the lockbox system will reduce collection time by 3 days. If Foster can invest funds at 8%, should it use the lockbox system? Assume a 360-day year.

A. Yes, producing savings of $140,000 per year.
B. Yes, producing savings of $60,000 per year.
C. No, producing a loss of $20,000 per year.
D. No, producing a loss of $60,000 per year.

Answer (A) is incorrect because this figure results from improperly adding, rather than subtracting, the cost of the lockbox.

Answer (B) is incorrect because this figure results from failing to subtract the cost of the lockbox.

Answer (C) is correct. The annual benefit (loss) from using the lockbox system is the excess (deficit) of interest earned on the early deposits over (under) the cost of the service. If the plan is adopted, Foster’s average cash balance will increase by $750,000 ($90,000,000 × (3 days ÷ 360 days)).

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost} \\
= (750,000 \times 8\%) - 80,000 \\
= $60,000 - $80,000 \\
= $(20,000)
\]

Answer (D) is incorrect because this figure is the interest revenue that would be earned on the early deposits.

A company has daily cash receipts of $150,000. The treasurer of the company has investigated a lockbox service whereby the bank that offers this service will reduce the company’s collection time by four days at a monthly fee of $2,500. If money market rates average 4% during the year, the additional annual income (loss) from using the lockbox service would be

A. $6,000
B. $(6,000)
C. $12,000
D. $(12,000)

Answer (A) is incorrect because this figure results from reversing the subtraction of the cost of the lockbox.

Answer (B) is correct. The additional annual income (loss) from using the lockbox service is the excess (deficit) of interest earned on the accelerated deposits over (under) the cost of the service. If the plan is adopted, the company’s average cash balance will increase by $600,000 ($150,000 × 4 days).

\[
\text{Benefit (loss)} = \text{Interest earned} - \text{Cost} \\
= (600,000 \times 4\%) - (2,500 \times 12 \text{ months}) \\
= $24,000 - $30,000 \\
= $(6,000)\]
Answer (C) is incorrect because the loss is $6,000, the difference between the $24,000 of additional interest revenue and the $30,000 total service charge.
Answer (D) is incorrect because the loss is $6,000, the difference between the $24,000 of additional interest revenue and the $30,000 total service charge.

A typical firm doing business nationally cannot expect to accelerate its cash inflow by

A. Establishing multiple collection centers throughout the country.
B. Employing a lockbox arrangement.
C. Initiating controls to accelerate the deposit and collection of large checks.
D. Maintaining compensating balances rather than paying cash for bank services.

Answer (A) is incorrect because multiple collection centers throughout the country will reduce the time required to receive cash in the mail. For example, California customers of a New York firm would make payment to a West Coast center. Thus, the company would receive the cash two or three days sooner.
Answer (B) is incorrect because direct deposit by customers into a lock-box also speeds cash into company accounts.
Answer (C) is incorrect because special handling of large checks is a cost-effective way to deposit large amounts.
Answer (D) is correct. Compensating balances are either (1) an absolute minimum balance or (2) a minimum average balance that bank customers must keep at the bank. These are generally required by the bank to compensate for the cost of services rendered. Maintaining compensating balances will not accelerate a company’s cash inflows because less cash will be available even though the amount of cash coming in remains unchanged.

Methods of accelerating cash collections include all of the following except

A. Decentralized collections.
B. Electronic funds transfers.
C. Compensating balances.
D. Lockbox systems.

Answer (A) is incorrect because it is a common method of accelerating cash collections.
Answer (B) is incorrect because it is a common method of accelerating cash collections.
Answer (C) is correct. Various methods of accelerating cash collections include decentralized collection outposts (normally one in each Federal Reserve District), electronic funds transfers, centralized banking for all company branches to avoid having to maintain minimum balances in several locations, and lockbox systems. A compensating balance is a minimum average or absolute amount that must be maintained in a bank account. Hence, it is not a means of accelerating cash collections. This requirement means that less cash is available to the depositor.
Answer (D) is incorrect because it is a common method of accelerating cash collections.

An automated clearinghouse (ACH) electronic transfer is a(n)

A. Electronic payment to a company’s account at a concentration bank.
B. Check that must be immediately cleared by the Federal Reserve Bank.
C. Computer-generated deposit ticket verifying deposit of funds.
D. Check-like instrument drawn against the payor and not against the bank.
- **Answer (A) is correct.** An ACH electronic funds transfer (EFT) is an electronic payment to a company’s account at a concentration bank. A concentration bank is a large bank to which a company transfers funds from local depository banks. These local banks operate the company’s lockboxes and thus serve as collection points. The transfer of funds to the concentration bank allows the company to take advantage of economies of scale in cash management. The use of ACHs facilitates concentration banking. ACHs are electronic networks operated by the Federal Reserve (except for the New York regional ACH association) that guarantee 1-day clearing.

- **Answer (B) is incorrect because A check is not involved in an EFT.**

- **Answer (C) is incorrect because An ACH transfer involves the actual transfer of funds electronically; it is not just a computer-generated document.**

- **Answer (D) is incorrect because An EFT is not a check-like instrument.**

[634] Kemple is a newly established janitorial firm, and the owner is deciding what type of checking account to open. Kemple is planning to keep a $500 minimum balance in the account for emergencies and plans to write roughly 80 checks per month. The bank charges $10 per month plus a $0.10 per check charge for a standard business checking account with no minimum balance. Kemple also has the option of a premium business checking account that requires a $2,500 minimum balance but has no monthly fees or per check charges. If Kemple’s cost of funds is 10%, which account should Kemple choose?

A. Standard account, because the savings is $34 per year.
B. Premium account, because the savings is $34 per year.
C. Standard account, because the savings is $16 per year.
D. Premium account, because the savings is $16 per year.

- **Answer (A) is incorrect because The relevant cost of the minimum premium account deposit is based on the $2,000 incremental deposit, not the full $2,500.**

- **Answer (B) is incorrect because The savings on the premium account is $16.**

- **Answer (C) is incorrect because The savings on the premium account is $16.**

- **Answer (D) is correct.** Kemple can compare the costs of the two alternatives as follows:

  Standard account = Variable cost + Fixed cost
  \[= [(80 \text{ checks} \times \$0.10) + \$10] \times 12 \text{ months} \]
  \[= \$18 \times 12 \text{ months} \]
  \[= \$216 \text{ per year} \]

  Premium account = Variable cost + Fixed cost
  \[= [\$0 + ($2,500 \text{ reqd.} - \$500 \text{ projected})] \times 10\% \]
  \[= $2,000 \times 10\% \]
  \[= $200 \text{ per year} \]

  Thus, the premium account should be selected because it is cheaper by $16 per year.

[635] A compensating balance

A. Compensates a financial institution for services rendered by providing it with deposits of funds.
B. Is used to compensate for possible losses on a marketable securities portfolio.
C. Is a level of inventory held to compensate for variations in usage rate and lead time.
D. Is the amount of prepaid interest on a loan.
Answer (A) is correct. A compensating balance is a minimum amount that the bank requires the firm to keep in its demand account. Compensating balances are noninterest-bearing and are meant to compensate the bank for various services rendered, such as unlimited check writing. These funds are obviously unavailable for short-term investment and thus incur an opportunity cost.

Answer (B) is incorrect because in financial accounting, a valuation allowance is used to reflect losses on marketable securities.

Answer (C) is incorrect because safety stock is held for such purposes.

Answer (D) is incorrect because interest deducted in advance is discount interest.

A working capital technique that increases the payable float and therefore delays the outflow of cash is

A. Concentration banking.
B. A draft.
C. Electronic data interchange (EDI).
D. A lockbox system.

Answer (A) is incorrect because Concentration banking, in connection with a lockbox network, is a technique used to accelerate cash receipts.

Answer (B) is correct. A draft is a three-party instrument in which one person (the drawer) orders a second person (the drawee) to pay money to a third person (the payee). A check is the most common form of draft. It is an instrument payable on demand in which the drawee is a bank. Consequently, a draft can be used to delay the outflow of cash. A draft can be dated on the due date of an invoice and will not be processed by the drawee until that date, thereby eliminating the necessity of writing a check earlier than the due date or using an EFT. Thus, the outflow is delayed until the check clears the drawee bank.

Answer (C) is incorrect because EDI is the communication of electronic documents directly from a computer in one entity to a computer in another entity. Thus, EDI expedites cash payments. The payee receives the money almost instantaneously.

Answer (D) is incorrect because a lockbox system is a technique used to accelerate cash receipts.

A working capital technique that delays the outflow of cash is

A. Factoring.
B. A draft.
C. A lockbox system.
D. Electronic funds transfer.

Answer (A) is incorrect because factoring is the sale of receivables and therefore concerns cash inflows, not outflows.

Answer (B) is correct. A draft is a three-party instrument in which one person (the drawer) orders a second person (the drawee) to pay money to a third person (the payee). A check is the most common form of draft. It is an instrument payable on demand in which the drawee is a bank. Consequently, a draft can be used to delay the outflow of cash. A draft can be dated on the due date of an invoice and will not be processed by the drawee until that date, thereby eliminating the necessity of writing a check earlier than the due date or using an EFT. Thus, the outflow is delayed until the check clears the drawee bank.

Answer (C) is incorrect because a lockbox system is a means of accelerating cash inflows.

Answer (D) is incorrect because an electronic funds transfer results in an immediate deduction from the payor’s bank account, thereby eliminating float.
Assume that each day a company writes and receives checks totaling $10,000. If it takes 5 days for the checks to clear and be deducted from the company’s account, and only 4 days for the deposits to clear, what is the float?

A. $10,000
B. $0
C. $(10,000)
D. $50,000

- Answer (A) is correct. The float period is the time between when a check is written and when it clears the payor’s checking account. Check float results in an interest-free loan to the payor because of the delay between payment by check and its deduction from the bank account. If checks written require 1 more day to clear than checks received, the net float equals 1 day’s receipts. The company will have free use of the money for 1 day. In this case, the amount is $10,000.
- Answer (B) is incorrect because the company enjoys 1 day’s net float because its checks clear more slowly than its deposits.
- Answer (C) is incorrect because the net float is positive. The company can write checks (up to $10,000) even when it has no money because the checks do not clear until a day after deposits clear.
- Answer (D) is incorrect because the net float represents the difference between when deposits clear and when disbursements clear.

Average daily collection of checks for a firm is $40,000. The firm also writes on the average $35,000 of checks daily. If the collection period for checks is 5 days, calculate the net float.

A. $25,000
B. $40,000
C. $175,000
D. $200,000

- Answer (A) is correct. The difference between collections and payables is $5,000 daily. Five days’ worth amounts to $25,000 of float.
- Answer (B) is incorrect because the amount of $40,000 ignores the impact of payables and the 5-day float period.
- Answer (C) is incorrect because the amount of $175,000 ignores the impact of receivables.
- Answer (D) is incorrect because the amount of $200,000 ignores the impact of payables.

A firm uses the following model to determine the optimal average cash balance (Q):

\[
Q = \frac{2 \times \text{annual cash disbursement}}{\text{cost per sale of T-Bill} \times \text{interest rate}}
\]

An increase in which one of the following would result in a decrease in the optimal cash balance?

A. Uncertainty of cash outflows.
B. Cost of a security trade.
C. Return on marketable securities.
D. Cash requirements for the year.
Answer (A) is incorrect because An increase in the uncertainty of cash outflows would require an increase in the optimal cash balance.

Answer (B) is incorrect because Since the cost of a security trade is in the numerator of the formula, an increase would cause an increase in the overall result.

Answer (C) is correct. The return on marketable securities is the opportunity cost of idle cash, i.e., the return that cash could be earning if it were invested at the market rate rather than held in a noninterest bearing account. This return is the denominator of the optimal balance formula provided above. Thus, an increase in the denominator decreases the optimal cash balance.

Answer (D) is incorrect because An increase in cash requirements would cause an increase in the optimal cash balance.

[641] All of the following are reasons for holding cash except for the

A. Precautionary motive.  
B. Transactions motive.  
C. Motive to make a profit.  
D. Motive to meet future needs.

Answer (A) is incorrect because The precautionary motive is one of the three motives for holding cash.

Answer (B) is incorrect because The transactions motive is one of the three motives for holding cash.

Answer (C) is correct. The three motives for holding cash are (1) as a medium of exchange (the transactions motive), (2) to provide a reserve for contingencies (the precautionary motive), and (3) to take advantage of unexpected opportunities (the speculative motive).

Answer (D) is incorrect because The precautionary motive (meeting future needs) is one of the three motives for holding cash.

[642] All of the following can be utilized by a firm in managing its cash outflows except

A. Zero-balance accounts.  
B. Centralization of payables.  
C. Controlled disbursement accounts.  
D. Lockbox system.

Answer (A) is incorrect because Zero-balance accounts are a means of managing cash outflows.

Answer (B) is incorrect because Centralization of payables is a means of managing cash outflows.

Answer (C) is incorrect because Controlled disbursement accounts are a means of managing cash outflows.

Answer (D) is correct. A lockbox system is a means of managing cash inflows, not outflows.
The Rolling Stone Corporation, an entertainment ticketing service, is considering the following means of speeding cash flow for the corporation:

- Lock Box System. This would cost $25 per month for each of its 170 banks and would result in interest savings of $5,240 per month.
- Drafts. Drafts would be used to pay for ticket refunds based on 4,000 refunds per month at a cost of $2.00 per draft, which would result in interest savings of $6,500 per month.
- Bank Float. Bank float would be used for the $1,000,000 in checks written each month. The bank would charge a 2% fee for this service, but the corporation will earn $22,000 in interest on the float.
- Electronic Transfer. Items over $25,000 would be electronically transferred; it is estimated that 700 items of this type would be made each month at a cost of $18 each, which would result in increased interest earnings of $14,000 per month.

Which of these methods of speeding cash flow should Rolling Stone Corporation adopt?

A. Lock box and electronic transfer only.
B. Bank float and electronic transfer only.
C. Lock box, drafts, and electronic transfer only.
D. Lock box, bank float, and electronic transfer only.

- Answer (A) is incorrect because the bank float is also a cost-effective method.
- Answer (B) is incorrect because the lockbox system is also a cost-effective method.
- Answer (C) is incorrect because drafts are not a cost-effective method.
- Answer (D) is correct. The total cost of each of the four methods that Rolling Stone is considering can be calculated as follows:

  Lockbox: $25 per-bank fee × 170 banks = $4,250
  Drafts: $2 per-draft fee × 4,000 drafts = $8,000
  Bank Float: $1,000,000 in checks written × 2% fee = $20,000
  Electronic Transfer: $18 per-transfer fee × 700 items = $12,600

  These costs are subtracted from the interest that could be earned under each method to arrive at the relevant gain or loss:

  Lockbox: $5,240 – $4,250 = $990
  Drafts: $6,500 – $8,000 = $(1,500)
  Bank Float: $22,000 – $20,000 = $2,000
  Electronic Transfer: $14,000 – $12,600 = $1,400

  The lockbox system, the bank float, and the electronic transfer are cost-effective.

JKL Industries requires its branch offices to transfer cash balances once per week to the central corporate account. A wire transfer costs $12 and assures the cash is available the same day. A depository transfer check (DTC) costs $1.50 and generally results in funds being available in 2 days. JKL’s cost of short-term funds averages 9%, and they use a 360-day year in all calculations. What is the minimum transfer amount that would justify the cost of a wire transfer as opposed to a DTC?

A. $21,000
B. $24,000
C. $27,000
D. $42,000

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Answer (A) is correct. To break even, the interest that JKL can earn on the early deposits must at least equal the excess of the wire transfer fee over the cost of the DTC.

\[
\text{Transfer amount} \times 9\% \times \left(\frac{2 \text{ days}}{360 \text{ days}}\right) = \$12 \text{ WT} - \$1.50 \text{ DTC} \\
\text{Transfer amount} \times .05\% = $10.50 \\
\text{Transfer amount} = $21,000
\]

Answer (B) is incorrect because the amount of $24,000 results from using the full cost of the wire transfer rather than the incremental cost.

Answer (C) is incorrect because the amount of $27,000 results from adding, rather than subtracting, the cost of the depository transfer check to the cost of the wire transfer.

Answer (D) is incorrect because the amount of $42,000 results from using only 1 day of interest rather than 2.

[645] The establishment and maintenance of a zero-balance account (ZBA) typically reduces all of the following except:

A. The cost of cash management.
B. The disbursement float.
C. Excess bank balances.
D. Management time.

Answer (A) is incorrect because a ZBA results in a higher balance in the account from which short-term investments are made. Thus, it reduces the net cost of cash management.

Answer (B) is correct. A ZBA is used to manage cash collections. It has a zero balance at the beginning of each day. At day’s end, a transfer is made to the ZBA to cover the checks presented. They do not affect the disbursement (payment) float.

Answer (C) is incorrect because a ZBA is intended to reduce bank balances.

Answer (D) is incorrect because a ZBA reduces the time devoted to cash management.

[646] Garner Products is considering a new accounts payable and cash disbursement process, which is projected to add 3 days to the disbursement schedule without having significant negative effects on supplier relations. Daily cash outflows average $1,500,000. Garner is in a short-term borrowing position for 8 months of the year and in an investment position for 4 months. On an annual basis, bank lending rates are expected to average 7% and marketable securities yields are expected to average 4%. What is the maximum annual expense that Garner could incur for this new process and still break even?

A. $90,000
B. $180,000
C. $270,000
D. $315,000

Answer (A) is incorrect because the amount of $90,000 is based on only 1 day’s savings, not 3 days.

Answer (B) is incorrect because the amount of $180,000 is based on the lower earnings rate of 4% rather than the weighted average rate of 6%.
• Answer (C) is correct. With average payments of $1,500,000 per day, the firm delays payments of $4,500,000 ($1,500,000 × 3 days). The rate at which average interest is saved or earned is calculated by weighting the two interest rates by the proportion of the year that each is earned:

\[
\begin{align*}
7\% \times 8 \text{ months} &= 56 \\
4\% \times 4 \text{ months} &= 16 \\
\frac{72}{12 \text{ months}} &= 6\%
\end{align*}
\]

The savings is $270,000 ($4,500,000 additional cash available × 6%).

• Answer (D) is incorrect because The amount of $315,000 is based on the 7% interest rate rather than the weighted average rate of 6%.

[647] Which one of the following is not a characteristic of a negotiable certificate of deposit? Negotiable certificates of deposit

A. Have a secondary market for investors.
B. Are regulated by the Federal Reserve System.
C. Are usually sold in denominations of a minimum of $100,000.
D. Have yields considerably greater than bankers’ acceptances and commercial paper.

• Answer (A) is incorrect because Negotiable CDs do have a secondary market (i.e., they are negotiable).
• Answer (B) is incorrect because Negotiable CDs are regulated.
• Answer (C) is incorrect because Negotiable CDs are typically issued in a denomination of $100,000.
• Answer (D) is correct. A certificate of deposit (CD) is a form of savings deposit that cannot be withdrawn before maturity without incurring a high penalty. A negotiable CD can be traded. CDs usually have a fairly high rate of return compared with other savings instruments because they are for fixed, usually long-term periods. However, their yield is less than that of commercial paper and bankers’ acceptances because they are less risky.

[648] In smaller businesses in which the management of cash is but one of numerous functions performed by the treasurer, various cost incentives and diversification arguments suggest that surplus cash should be invested in

A. Commercial paper.
B. Bankers’ acceptances.
C. Money market mutual funds.
D. Corporate bonds.

• Answer (A) is incorrect because A small firm may not have enough surplus cash to invest in commercial paper, which usually consists of secured or unsecured promissory notes of large corporations.
• Answer (B) is incorrect because The transactions cost of bankers’ acceptances is high. A banker’s acceptance is a unique credit instrument used to finance both domestic and international “self-liquidating” transactions. It is usually initiated by a bank’s irrevocable letter of credit on behalf of the bank’s customer, on which the company doing business with the bank’s customer draws a time draft. The company discounts the time draft with the company’s local bank and receives immediate payment. The local bank forwards the time draft to the bank customer for payment.
• Answer (C) is correct. A small firm with surplus cash should invest for the highest return and lowest risk. The ability to convert the investment into cash without a loss of principal is also important. Money market mutual funds invest in money market certificates such as treasury bills, negotiable CDs, and commercial paper. Because of diversification, these mutual funds are superior to any single instrument.
• Answer (D) is incorrect because An increase in interest rates could cause a substantial loss in principal.
When managing cash and short-term investments, a corporate treasurer is primarily concerned with

A. Maximizing rate of return.
B. Minimizing taxes.
C. Investing in Treasury bonds since they have no default risk.
D. Liquidity and safety.

- Answer (A) is incorrect because Most companies are not in business to earn high returns on liquid assets (i.e., they are held to facilitate operations).
- Answer (B) is incorrect because The holding of cash and cash-like assets is not a major factor in controlling taxes.
- Answer (C) is incorrect because Investments in Treasury bonds do not have sufficient liquidity to serve as short-term assets.
- Answer (D) is correct. Cash and short-term investments are crucial to a firm’s continuing success. Sufficient liquidity must be available to meet payments as they come due. At the same time, liquid assets are subject to significant control risk. Therefore, liquidity and safety are the primary concerns of the treasurer when dealing with highly liquid assets. Cash and short-term investments are held because of their ability to facilitate routine operations of the company. These assets are not held for purposes of achieving investment returns.

All of the following are alternative marketable securities suitable for investment except

A. U.S. Treasury bills.
B. Eurodollars.
C. Commercial paper.
D. Convertible bonds.

- Answer (A) is incorrect because U.S. Treasury bills are short-term marketable securities.
- Answer (B) is incorrect because Eurodollars are short-term marketable securities.
- Answer (C) is incorrect because Commercial paper is a short-term marketable security.
- Answer (D) is correct. Marketable securities are near-cash items used primarily for short-term investment. Examples include U.S. Treasury bills, Eurodollars, commercial paper, money-market mutual funds with portfolios of short-term securities, bankers’ acceptances, floating rate preferred stock, and negotiable CDs of U.S. banks. A convertible bond is not a short-term investment because its maturity date is usually more than 1 year in the future and its price can be influenced substantially by changes in interest rates or by changes in the investee’s stock price.

Which security is most often held as a substitute for cash?

A. Treasury bills.
B. Common stock.
C. Gold.
D. Aaa corporate bonds.

- Answer (A) is correct. A Treasury bill is a short-term U.S. government obligation that is sold at a discount from its face value. A Treasury bill is highly liquid and nearly risk-free, and it is often held as a substitute for cash.
- Answer (B) is incorrect because It lacks the liquidity necessary to be a cash substitute. It can also be quite a risky investment.
- Answer (C) is incorrect because It lacks the liquidity necessary to be a cash substitute. It can also be quite a risky investment.
Answer (D) is incorrect because It lacks the liquidity necessary to be a cash substitute. It can also be quite a risky investment.

Obligations issued by federal agencies other than the U.S. Treasury Department are:

A. Guaranteed by the U.S. government but not by the agency issuing the security.
B. Guaranteed neither by the agency issuing the security nor by the U.S. government.
C. Guaranteed by the agency issuing the security but not by the U.S. government.
D. Not easily marketed.

- Answer (A) is incorrect because Agency obligations are not insured by the U.S. government.
- Answer (B) is incorrect because Agency obligations are guaranteed by the issuing agency.
- Answer (C) is correct. Obligations issued by the Treasury Department are insured by the full faith and credit of the U.S. government. However, obligations of other federal agencies (agency securities) are guaranteed only by the issuing agency, not the federal government. Exceptions are securities issued by the Government National Mortgage Association (Ginnie Mae), which have the full backing of the U.S. government.
- Answer (D) is incorrect because Agency securities are widely marketed with an active secondary market.

Hendrix, Inc., is interested in purchasing a $100 U.S. Treasury bill and was presented with the following options:

<table>
<thead>
<tr>
<th>Due Date</th>
<th>Discount Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1</td>
<td>180 days</td>
</tr>
<tr>
<td>Option 2</td>
<td>360 days</td>
</tr>
<tr>
<td>Option 3</td>
<td>120 days</td>
</tr>
<tr>
<td>Option 4</td>
<td>240 days</td>
</tr>
</tbody>
</table>

If Hendrix wishes to buy the Treasury bill at the lowest purchasing price, which option should be chosen, assuming a 360-day year?

A. Option 1.
B. Option 2.
C. Option 3.
D. Option 4.

- Answer (A) is incorrect because Option 1 has a purchase price of $97.00.
- Answer (B) is correct. To determine the amount of interest the lender will earn, the 3.5% discount rate is multiplied by the face amount of the Treasury bill. The interest on this Treasury bill is $3.50 ($100 × 3.5% × 1 year). Thus, the purchase price is $96.50 ($100 – $3.5).
- Answer (C) is incorrect because Option 3 has a purchase price of $97.33.
- Answer (D) is incorrect because Option 4 has a purchase price of $97.00.

Assuming a 360-day year, the current price of a $100 U.S. Treasury bill due in 180 days on a 6% discount basis is:

A. $97.00
B. $94.00
C. $100.00
D. $93.00
Answer (A) is correct. The 6% discount rate is multiplied times the face amount of the Treasury bill to determine the amount of interest the lender will earn. The interest on this Treasury bill is $3 ($100 \times 6\% \times .5 \text{ year})$. Thus, the purchase price is $97 ($100 – $3).
Answer (B) is incorrect because the interest is for 180 days, not a full year.
Answer (C) is incorrect because the purchase price will always be less than the face value when the Treasury bill is sold at a discount.
Answer (D) is incorrect because the interest rate is 6% per year. The question is based on 180 days or half a year.

**[655]** Short-term securities issued by the Federal Housing Administration are known as

A. Agency securities.
B. Bankers' acceptances.
C. Commercial paper.
D. Repurchase agreements.

Answer (A) is correct. A short-term security issued by a corporation or agency created by the U.S. government, such as the Federal Housing Administration, is an agency security (agency issue). Among the largest issuers of agency securities (excluding the Treasury) are the Federal Home Loan Banks, the Federal National Mortgage Association (Fannie Mae), and the other entities that provide credit to farmers and home buyers. Other issuers of home mortgage-backed securities include the Government National Mortgage Association (Ginnie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac).
Answer (B) is incorrect because Bankers' acceptances are issued by commercial banks to finance specific transactions.
Answer (C) is incorrect because Commercial paper is a short-term, unsecured, promissory note issued by a commercial enterprise.
Answer (D) is incorrect because a repurchase agreement involves what is in essence a secured loan to a dealer in government securities.

**[656]** The best example of a marketable security with minimal risk would be

A. Municipal bonds.
B. The common stock of an AAA-rated company.
C. Gold.
D. The commercial paper of an AAA-rated company.

Answer (A) is incorrect because Municipal bonds are rarely considered marketable securities in the accounting sense. They constitute long-term debt.
Answer (B) is incorrect because Common stock does not have as high a priority in company assets as commercial paper or other debt.
Answer (C) is incorrect because Gold is a commodity, not a security. Also, its price fluctuates for many reasons that do not affect the value of commercial paper.
Answer (D) is correct. Of the choices given, the commercial paper of a top-rated (most creditworthy) company has the least risk. Commercial paper is preferable to stock or stock options because the latter represent only a residual equity in a corporation. Commercial paper is debt and thus has priority over shareholders’ claims. Also, commercial paper is a very short-term investment. The maximum maturity allowed without SEC registration is 270 days. However, it can be sold only to sophisticated investors without registration.
[657] Which one of the following instruments would be least appropriate for a corporate treasurer to utilize for temporary investment of cash?

A. U.S. Treasury bills.  
B. Money market mutual funds.  
C. Commercial paper.  
D. Municipal bonds.

- Answer (A) is incorrect because U.S. Treasury bills have maturities of 1 year or less.  
- Answer (B) is incorrect because The money market is the short-term market for investments.  
- Answer (C) is incorrect because Commercial paper has a maturity of at most 270 days.  
- Answer (D) is correct. Bonds are long-term financial instruments. Thus, they are an inappropriate temporary investment of cash.

[658] Which one of the following statements best characterizes U.S. Treasury bills?

A. They have no coupon rate, no interest rate risk, and are issued at par.  
B. They have an active secondary market, 1- to 24-month maturities, and monthly interest payments.  
C. They have an active secondary market, the interest received is exempt from federal income tax, and there is no interest rate risk.  
D. They have no coupon rate, no default risk, and interest received is subject to federal income tax.

- Answer (A) is incorrect because U.S. Treasury bills are issued on a discount basis, not at par.  
- Answer (B) is incorrect because U.S. Treasury bills have maturities of 1 year or less and are sold on a discount basis. They do not pay interest.  
- Answer (C) is incorrect because The interest on U.S. Treasury bills is subject to federal income tax.  
- Answer (D) is correct. U.S. Treasury bills have no coupon rate because they are sold at a discount. They are backed by the full faith and credit of the United States government, and the interest received is subject to federal income tax.

[659] The Duoplan Company is determining the most appropriate source of short-term funding. Trade credit terms from suppliers are 2/30, net 90. The rate for borrowing at the bank is 12%. The company has also been approached by an investment banker offering to issue Duoplan’s commercial paper. The commercial paper would be issued quarterly in increments of $9.1 million with net proceeds of $8.8 million. Which option should the firm select?

A. The trade discount, because it provides the lowest cost of funds.  
B. Bank borrowing, because it provides the lowest cost of funds.  
C. Commercial paper, because it provides the lowest cost of funds.  
D. The costs are so similar that the decision is a matter of convenience.

- Answer (A) is incorrect because The annual cost of the trade discount is 12.245% (2/98 × 6 times per year).  
- Answer (B) is correct. Borrowing at the bank has a rate of 12%. The commercial paper has an annualized rate of 13.6% \[\frac{[(9.1 \text{ million} - 8.8 \text{ million}) \div 8.8 \text{ million}] \times 4 \text{ quarters}}{360 \text{ days} \div (90 - 30 \text{ days})}\]. Not taking the trade discount has an annualized rate of 12.245% \[\left(\frac{12\% + 98\%}{360 \text{ days} \div (90 - 30 \text{ days})}\right)\].  
- Answer (C) is incorrect because The annualized cost of the commercial paper is 13.6%.

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Answer (D) is incorrect because the differences in cost are significant given the amounts involved.

The Texas Corporation is considering the following opportunities to purchase an investment at the following amounts and discounts:

<table>
<thead>
<tr>
<th>Term</th>
<th>Amount</th>
<th>Discount</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 days</td>
<td>$80,000</td>
<td>5%</td>
</tr>
<tr>
<td>180 days</td>
<td>75,000</td>
<td>6%</td>
</tr>
<tr>
<td>270 days</td>
<td>100,000</td>
<td>5%</td>
</tr>
<tr>
<td>360 days</td>
<td>60,000</td>
<td>10%</td>
</tr>
</tbody>
</table>

Which opportunity offers the Texas Corporation the highest annual yield?

A. 90-day investment.
B. 180-day investment.
C. 270-day investment.
D. 360-day investment.

Answer (A) is correct. The first step is to calculate the nominal return that each investment will provide:

<table>
<thead>
<tr>
<th>Term</th>
<th>Amount</th>
<th>Discount</th>
<th>Nominal Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 days</td>
<td>$80,000</td>
<td>5%</td>
<td>$4,000</td>
</tr>
<tr>
<td>180 days</td>
<td>75,000</td>
<td>6%</td>
<td>4,500</td>
</tr>
<tr>
<td>270 days</td>
<td>100,000</td>
<td>5%</td>
<td>5,000</td>
</tr>
<tr>
<td>360 days</td>
<td>60,000</td>
<td>10%</td>
<td>6,000</td>
</tr>
</tbody>
</table>

The next step is to restate the nominal returns on an annualized basis:

<table>
<thead>
<tr>
<th>Term</th>
<th>Nominal Return</th>
<th>Fraction of Year</th>
<th>Annualized Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 days</td>
<td>$4,000</td>
<td>(90 ÷ 360)</td>
<td>$16,000</td>
</tr>
<tr>
<td>180 days</td>
<td>4,500</td>
<td>(180 ÷ 360)</td>
<td>9,000</td>
</tr>
<tr>
<td>270 days</td>
<td>5,000</td>
<td>(270 ÷ 360)</td>
<td>6,667</td>
</tr>
<tr>
<td>360 days</td>
<td>6,000</td>
<td>(360 ÷ 360)</td>
<td>6,000</td>
</tr>
</tbody>
</table>

The final step is to calculate the annual yield of each investment.

<table>
<thead>
<tr>
<th>Term</th>
<th>Annualized Return</th>
<th>Amount Invested</th>
<th>Annual Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 days</td>
<td>$16,000</td>
<td>$80,000</td>
<td>20.0%</td>
</tr>
<tr>
<td>180 days</td>
<td>9,000</td>
<td>75,000</td>
<td>12.0%</td>
</tr>
<tr>
<td>270 days</td>
<td>6,667</td>
<td>100,000</td>
<td>6.7%</td>
</tr>
<tr>
<td>360 days</td>
<td>6,000</td>
<td>60,000</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

Answer (B) is incorrect because the annual yield on the 180-day investment is only 12%.
Answer (C) is incorrect because the annual yield on the 270-day investment is only 6.7%.
Answer (D) is incorrect because the annual yield on the 360-day investment is only 10%.
A change in credit policy has caused an increase in sales, an increase in discounts taken, a reduction in the investment in accounts receivable, and a reduction in the number of doubtful accounts. Based upon this information, we know that

A. Net profit has increased.
B. The average collection period has decreased.
C. Gross profit has declined.
D. The size of the discount offered has decreased.

- Answer (A) is incorrect because No statement can be made with respect to profits without knowing costs.
- Answer (B) is correct. An increase in discounts taken accompanied by declines in receivables balances and doubtful accounts all indicate that collections on the increased sales have been accelerated. Accordingly, the average collection period must have declined. The average collection period is a ratio calculated by dividing the number of days in a year (365) by the receivable turnover. Thus, the higher the turnover, the shorter the average collection period. The turnover increases when either sales (the numerator) increase, or receivables (the denominator) decrease. Accomplishing both higher sales and a lower receivables increases the turnover and results in a shorter collection period.
- Answer (C) is incorrect because No statement can be made with respect to profits without knowing costs.
- Answer (D) is incorrect because The discount may have been increased, which has led to quicker payments.

---

A change in credit policy has caused an increase in sales, an increase in discounts taken, a decrease in the amount of bad debts, and a decrease in the investment in accounts receivable. Based upon this information, the company’s

A. Average collection period has decreased.
B. Percentage discount offered has decreased.
C. Accounts receivable turnover has decreased.
D. Working capital has increased.

- Answer (A) is correct. An increase in discounts taken accompanied by declines in receivables balances and doubtful accounts all indicate that collections on the increased sales have been accelerated. Accordingly, the average collection period must have declined. The average collection period is a ratio calculated by dividing the number of days in a year (365) by the receivable turnover. Thus, the higher the turnover, the shorter the average collection period. The turnover increases when either sales (the numerator) increase, or receivables (the denominator) decrease. Accomplishing both higher sales and a lower receivables increases the turnover and results in a shorter collection period.
- Answer (B) is incorrect because A decrease in the percentage discount offered provides no incentive for early payment.
- Answer (C) is incorrect because Accounts receivable turnover (sales ÷ average receivables) has increased.
- Answer (D) is incorrect because No information is given relative to working capital elements other than receivables. Both receivables and cash are elements of working capital, so an acceleration of customer payments will have no effect on working capital.

---

The average collection period for a firm measures the number of days

A. After a typical credit sale is made until the firm receives the payment.
B. For a typical check to “clear” through the banking system.
C. Beyond the end of the credit period before a typical customer payment is received.
D. Before a typical account becomes delinquent.

- Answer (A) is correct. The average collection period measures the number of days between the date of sale and the date of collection. It should be related to a firm’s credit terms. For example, a firm that allows terms of 2/15, net 30, should have an average collection period of somewhere between 15 and 30 days.
Answer (B) is incorrect because it describes the concept of float.

Answer (C) is incorrect because the average collection period includes the total time before a payment is received, including the periods both before and after the end of the normal credit period.

Answer (D) is incorrect because it describes the normal credit period.

The sales manager at Ryan Company feels confident that, if the credit policy at Ryan’s were changed, sales would increase and, consequently, the company would utilize excess capacity. The two credit proposals being considered are as follows:

<table>
<thead>
<tr>
<th>Proposal A</th>
<th>Proposal B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in sales</td>
<td>$500,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>20%</td>
</tr>
<tr>
<td>Bad debt percentage</td>
<td>5%</td>
</tr>
<tr>
<td>Increase in operating profits</td>
<td>$75,000</td>
</tr>
<tr>
<td>Desired return on sales</td>
<td>15%</td>
</tr>
</tbody>
</table>

Currently, payment terms are net 30. The proposed payment terms for Proposal A and Proposal B are net 45 and net 90, respectively. An analysis to compare these two proposals for the change in credit policy would include all of the following factors except the

A. Cost of funds for Ryan.
B. Current bad debt experience.
C. Impact on the current customer base of extending terms to only certain customers.
D. Bank loan covenants on days’ sales outstanding.

- Answer (A) is incorrect because the cost of funds is an obvious element in the analysis of any investment.
- Answer (B) is correct. All factors should be considered that differ between the two policies. Factors that do not differ, such as the current bad debt experience, are not relevant. Ryan must estimate the expected bad debt losses under each new policy.
- Answer (C) is incorrect because the impact on the current customer base of extending terms to only certain customers is relevant. The current customers may demand the same terms.
- Answer (D) is incorrect because existing loan agreements may require Ryan to maintain certain ratios at stated levels. Thus, Ryan’s ability to increase receivables and possible bad debt losses may be limited.

Which of the following represents a firm’s average gross receivables balance?

I. Days’ sales in receivables × accounts receivable turnover.
II. Average daily sales × average collection period.
III. Net sales ÷ average gross receivables.

A. I only.
B. I and II only.
C. II only.
D. II and III only.

- Answer (A) is incorrect because Alternative I cannot be correct. Neither of the multiplicands is a dollar figure, so the product could not be the dollar balance of receivables.
- Answer (B) is incorrect because Alternative I cannot be correct. Neither of the multiplicands is a dollar figure, so the product could not be the dollar balance of receivables.

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Answer (C) is correct. A firm’s average gross receivables balance can be calculated by multiplying average daily sales by the average collection period (days’ sales outstanding). Alternatively, annual credit sales can be divided by the accounts-receivable turnover (net credit sales ÷ average accounts receivable) to obtain the average balance in receivables.

Answer (D) is incorrect because Alternative III cannot be correct. It contains average gross receivables, the amount being calculated.

[666] An aging of accounts receivable measures the

A. Ability of the firm to meet short-term obligations.
B. Average length of time that receivables have been outstanding.
C. Percentage of sales that have been collected after a given time period.
D. Amount of receivables that have been outstanding for given lengths of time.

Answer (A) is incorrect because An aging schedule is used for receivables, not liabilities.
Answer (B) is incorrect because An aging schedule concerns specific accounts, not averages.
Answer (C) is incorrect because An aging schedule focuses on uncollected receivables.
Answer (D) is correct. The purpose of an aging of receivables is to classify receivables by due date. Those that are current (not past due) are listed in one column, those less than 30 days past due in another column, etc. The amount in each category can then be multiplied by an estimated bad debt percentage that is based on a company’s credit experience and other factors. The theory is that the oldest receivables are the least likely to be collectible. Aging the receivables and estimating the uncollectible amounts is one method of arriving at the appropriate balance sheet valuation of the accounts receivable account.

[667] When a company analyzes credit applicants and increases the quality of the accounts rejected, the company is attempting to

A. Maximize sales.
B. Increase bad-debt losses.
C. Increase the average collection period.
D. Maximize profits.

Answer (A) is incorrect because Tightening credit will reduce sales.
Answer (B) is incorrect because Tightening credit will reduce bad debt losses.
Answer (C) is incorrect because Most likely, higher quality accounts will mean a shorter average collection period.
Answer (D) is correct. Increasing the quality of the accounts rejected means that fewer sales will be made. The company is therefore not trying to maximize its sales or increase its bad debt losses. The objective is to reduce bad debt losses and thereby maximize profits.

[668] An increase in sales resulting from an increased cash discount for prompt payment would be expected to cause

A. An increase in the operating cycle.
B. An increase in the average collection period.
C. A decrease in the cash conversion cycle.
D. A decrease in purchase discounts taken.
Answer (A) is incorrect because The operating cycle would decrease since the average time from cash disbursement to cash realization would be shorter.
Answer (B) is incorrect because The average collection period would decrease since the average time from cash disbursement to cash realization would be shorter.
Answer (C) is correct. If the cause of increased sales is an increase in the cash discount, it can be inferred that the additional customers would pay during the discount period. Thus, cash would be collected more quickly than previously and the cash conversion cycle would be shortened.
Answer (D) is incorrect because More customers will take discounts.

[669] An organization would usually offer credit terms of 2/10, net 30 when

A. The organization can borrow funds at a rate exceeding the annual interest cost.
B. The organization can borrow funds at a rate less than the annual interest cost.
C. The cost of capital approaches the prime rate.
D. Most competitors are offering the same terms, and the organization has a shortage of cash.

Answer (A) is incorrect because If the company does not need cash, it would not offer cash discounts, regardless of its cost of capital, unless required to match competition.
Answer (B) is incorrect because The ability to borrow at a lower rate is a reason for not offering cash discounts.
Answer (C) is incorrect because The relationship between the cost of capital and the prime rate may not be relevant if the firm cannot borrow at the prime rate.
Answer (D) is correct. Because these terms involve an annual interest cost of over 36%, a company would not offer them unless it desperately needed cash. Also, credit terms are typically somewhat standardized within an industry. Thus, if most companies in the industry offer similar terms, a firm will likely be forced to match the competition or lose market share.

[670] Which one of the following statements is most likely to be true if a seller extends credit to a purchaser for a period of time longer than the purchaser’s operating cycle? The seller

A. Will have a lower level of accounts receivable than those companies whose credit period is shorter than the purchaser’s operating cycle.
B. Can be certain that the purchaser will be able to convert the inventory into cash before payment is due.
C. Has no need for a stated discount rate or credit period.
D. Has no need for a stated discount rate or credit period.

Answer (A) is incorrect because A seller who extends long-term credit will have a higher level of receivables than a firm with a shorter credit period.
Answer (B) is correct. The normal operating cycle is the period from the acquisition of inventory to the collection of the account receivable. If trade credit is for a period longer than the normal operating cycle, the seller must be financing more than just the purchase of inventory.
Answer (C) is incorrect because The seller is not guaranteed that a purchaser will resell the merchandise.
Answer (D) is incorrect because Offering a discount may accelerate payment.
The one item listed below that would warrant the least amount of consideration in credit and collection policy decisions is the

A. Quality of accounts accepted.
B. Quantity discount given.
C. Cash discount given.
D. Level of collection expenditures.

- Answer (A) is incorrect because The quality of accounts is important to credit policy since it is inversely related to both sales and bad debts.
- Answer (B) is correct. A quantity discount is an attempt to increase sales by reducing the unit price on bulk purchases. It concerns only the price term of an agreement, not the credit term, and thus is unrelated to credit and collection policy.
- Answer (C) is incorrect because Offering a cash discount improves cash flow and reduces receivables and the cost of extending credit.
- Answer (D) is incorrect because The level of collection expenditures must be considered when implementing a collection policy. The marginal cost of a credit and collection policy should not exceed its revenue.

Price Publishing is considering a change in its credit terms from n/30 to 2/10, n/30. The company’s budgeted sales for the coming year are $24,000,000, of which 90% are expected to be made on credit. If the new credit terms are adopted, Price estimates that discounts will be taken on 50% of the credit sales; however, uncollectible accounts will be unchanged. The new credit terms will result in expected discounts taken in the coming year of

A. $216,000
B. $240,000
C. $432,000
D. $480,000

- Answer (A) is correct. Price can calculate expected discounts taken under the new credit policy as follows:

  Total sales $24,000,000
  Times: percentage on credit  x 90%
  Credit sales $21,600,000
  Times: subject to discount  x 50%
  Sales subject to discount $10,800,000
  Times: discount percentage  x 2%
  Expected discounts taken $ 216,000

- Answer (B) is incorrect because Only 90% of the sales are on credit; $240,000 would be correct only if a cash discount were allowed on cash sales as well as credit sales.
- Answer (C) is incorrect because This figure is the discount on all credit sales.
- Answer (D) is incorrect because This figure is based on the assumption that all sales will be discounted.
Dogfur Publishing is considering a change in its credit terms from n/20 to 3/10, n/20. The company’s budgeted sales for the coming year are $20,000,000, of which 80% are expected to be made on credit. If the new credit terms are adopted, Dogfur management estimates that discounts will be taken on 60% of the credit sales; however, uncollectible accounts will be unchanged. The new credit terms will result in expected discounts taken in the coming year of

A. $288,000  
B. $360,000  
C. $480,000  
D. $600,000

- **Answer (A) is correct.** Dogfur can calculate expected discounts taken under the new credit policy as follows:

  Total sales $20,000,000  
  Times: percentage on credit × 80%  
  Credit sales $16,000,000  
  Times: subject to discount × 60%  
  Sales subject to discount $  9,600,000  
  Times: discount percentage × 3%  
  Expected discounts taken $     288,000

- **Answer (B) is incorrect because** This figure assumes all sales are on credit and that 60% of discounts are taken.
- **Answer (C) is incorrect because** This figure is the potential discount on all credit sales.
- **Answer (D) is incorrect because** The amount of $600,000 assumes all sales are on credit and that 100% of the discounts are taken.

Clauson, Inc., grants credit terms of 1/15, net 30 and projects gross sales for next year of $2,000,000. The credit manager estimates that 40% of their customers pay on the discount date, 40% on the net due date, and 20% pay 15 days after the net due date. Assuming uniform sales and a 360-day year, what is the projected days’ sales outstanding (rounded to the nearest whole day)?

A. 20 days.  
B. 24 days.  
C. 27 days.  
D. 30 days.

- **Answer (A) is incorrect because** Average receivables are outstanding for much more than 20 days.
- **Answer (B) is incorrect because** Twenty-four days assumes 40% of receivables are collected after 15 days and 60% after 30 days.
- **Answer (C) is correct.** The days’ sales outstanding can be determined by weighting the collection period for each group of receivables by its collection percentage. Hence, the projected days’ sales outstanding equal 27 days \([(15 \text{ days} \times 40\%) + (30 \text{ days} \times 40\%) + (45 \text{ days} \times 20\% )]\).
- **Answer (D) is incorrect because** More receivables are collected on the 15th day than on the 45th day; thus, the average must be less than 30 days.
Jackson Distributors sells to retail stores on credit terms of 2/10, net 30. Daily sales average 150 units at a price of $300 each. All sales are on credit and 60% of customers take the discount and pay on day 10 while the rest of the customers pay on day 30. The amount of Jackson’s accounts receivable that is paid within the discount period is

A. $1,350,000  
B. $990,000  
C. $900,000  
D. $810,000

- Answer (A) is incorrect because Only 60% of the sales will be paid for within the 10-day discount period.
- Answer (B) is incorrect because This figure results from using monthly sales of $55,000 rather than $45,000.
- Answer (C) is incorrect because This figure results from using monthly sales of $50,000 rather than $45,000.
- Answer (D) is correct. The firm has daily sales of $45,000 consisting of 150 units at $300 each. For 30 days, sales total $1,350,000. Of these sales, 40%, or $540,000 ($1,350,000 × 40%), will be uncollected because customers do not take their discounts. The remaining $810,000 ($1,350,000 × 60%) will be paid within the discount period.

A firm averages $4,000 in sales per day and is paid, on an average, within 30 days of the sale. After they receive their invoice, 55% of the customers pay by check, while the remaining 45% pay by credit card. Approximately how much would the company show in accounts receivable on its balance sheet on any given date?

A. $4,000  
B. $48,000  
C. $54,000  
D. $120,000

- Answer (A) is incorrect because The amount of $4,000 is only 1 day’s sales.
- Answer (B) is incorrect because Invoices are outstanding for 30 days, not 12 days.
- Answer (C) is incorrect because The amount of $54,000 is based on the 45% of collections via credit card.
- Answer (D) is correct. The average balance of receivables is $120,000 ($4,000 × 30 days). Whether customers pay by credit card or check, collection requires 30 days.

Dartmoor Company’s budgeted sales for the coming year are $40,500,000, of which 80% are expected to be credit sales at terms of n/30. Dartmoor estimates that a proposed relaxation of credit standards will increase credit sales by 20% and increase the average collection period from 30 days to 40 days. Based on a 360-day year, the proposed relaxation of credit standards will result in an expected increase in the average accounts receivable balance of

A. $540,000  
B. $900,000  
C. $1,620,000  
D. $2,700,000

- Answer (A) is incorrect because This figure results from ignoring the increase in the average collection period to 40 days.
- Answer (B) is incorrect because This figure results from ignoring the projected 20% increase in credit sales.
Answer (C) is correct. Projected credit sales for the year under the old credit policy were $32,400,000 ($40,500,000 × 80%). The projected average balance in receivables was therefore $2,700,000 ($32,400,000 × (30 days ÷ 360 days)). Under the new policy, projected credit sales will be $38,880,000 ($32,400,000 × 1.2), resulting in a new average receivables balance of $4,320,000 ($38,880,000 × (40 days ÷ 360 days)). Hence, the expected increase in the balance is $1,620,000 ($4,320,000 – $2,700,000).

Answer (D) is incorrect because this figure is the average amount in accounts receivable before any change in credit terms.

A company plans to tighten its credit policy. The new policy will decrease the average number of days in collection from 75 to 50 days and will reduce the ratio of credit sales to total revenue from 70% to 60%. The company estimates that projected sales will be 5% less if the proposed new credit policy is implemented. If projected sales for the coming year are $50 million, calculate the dollar impact on accounts receivable of this proposed change in credit policy. Assume a 360-day year.

A. $6,500,000 decrease.
B. $3,819,445 decrease.
C. $3,333,334 decrease.
D. $18,749,778 increase.

Answer (A) is incorrect because this figure is the decrease in credit sales.
Answer (B) is incorrect because this figure is calculated using total, not credit, sales.
Answer (C) is correct. Projected credit sales for the year under the old credit policy were $35 million ($50,000,000 × 70%). The level of average receivables was calculated as follows:

Receivables turnover = Days in year ÷ Average collection period
= 360 days ÷ 75 days
= 4.8 times per year

Average receivables = Net credit sales ÷ Receivables turnover
= $35,000,000 ÷ 4.8 times
= $7,291,667

Under the new policy, total sales will be $47.5 million ($50,000,000 × 95%), and credit sales will be $28.5 million ($47,500,000 × 60%). The new level of average receivables is calculated as follows:

Receivables turnover = Days in year ÷ Average collection period
= 360 days ÷ 50 days
= 7.2 times per year

Average receivables = Net credit sales ÷ Receivables turnover
= $28,500,000 ÷ 7.2 times
= $3,958,333

The average receivables balance will therefore be reduced by $3,333,334 (7,291,667 – 3,958,333).

Answer (D) is incorrect because receivables will decrease.
[679] Flyn Company’s budgeted sales for the coming year are expected to be $50,000,000, of which 75% are expected to be credit sales at terms of n/30. Flyn estimates that a proposed relaxation of credit standards will increase credit sales by 25% and increase the average collection period from 20 days to 30 days. Based on a 360-day year, the proposed relaxation of credit standards will result in an expected increase in the average accounts receivable balance of

A. $520,833  
B. $1,822,917  
C. $2,083,333  
D. $3,906,250

- Answer (A) is incorrect because this figure results from failing to account for the increased average collection period.
- Answer (B) is correct. Projected credit sales for the year under the old credit policy were $37,500,000 ($50,000,000 × 75%), resulting in an average balance in receivables of $2,083,333 ($37,500,000 × (20 days ÷ 360 days)). Under the new policy, credit sales will be $46,875,000 ($37,500,000 × 1.25), resulting in an average receivables balance of $3,906,250 ($46,875,000 × (30 days ÷ 360 days)). Hence, the expected increase in the balance is $1,822,917 ($3,906,250 – $2,083,333).
- Answer (C) is incorrect because this figure is the average accounts receivable balance under the existing credit terms.
- Answer (D) is incorrect because this figure is the average accounts receivable balance under the proposed credit terms.

[680] Yonder Motors sells 20,000 automobiles per year for $25,000 each. The firm’s average receivables are $30,000,000 and average inventory is $40,000,000. Yonder’s average collection period is closest to which one of the following? Assume a 365-day year.

A. 17 days.  
B. 22 days.  
C. 29 days.  
D. 61 days.

- Answer (A) is incorrect because the figure results from improperly using the turnover rate (16.667) as the number of days.
- Answer (B) is correct. The average collection period, also called the days sales outstanding in receivables, is calculated as the number of days in the year over the receivables turnover ratio. Yonder’s can be thus calculated as follows:

\[
\text{Average collection period} = \frac{\text{Days in year}}{\text{Accounts receivable turnover}} = \frac{365}{\left(\frac{\text{Net credit sales}}{\text{Average net receivables}}\right)}
\]

\[
= \frac{365}{\frac{[(20,000 \times 25,000)]}{30,000,000}}
\]

\[
= \frac{365}{(500,000,000 \div 30,000,000)}
\]

\[
= 365 \div 16.667
\]

\[
= 21.9 \text{ days}
\]

- Answer (C) is incorrect because the figure results from improperly using average inventory instead of average receivables.
- Answer (D) is incorrect because the figure results from improperly adding together the average collection period and the average number of days that inventory is held.
A company with $4.8 million in credit sales per year plans to relax its credit standards, projecting that this will increase credit sales by $720,000. The company’s average collection period for new customers is expected to be 75 days, and the payment behavior of the existing customers is not expected to change. Variable costs are 80% of sales. The firm’s opportunity cost is 20% before taxes. Assuming a 360-day year, what is the company’s benefit (loss) on the planned change in credit terms?

A. $0  
B. $28,800  
C. $120,000  
D. $144,000

• Answer (A) is incorrect because The company benefits from the change in credit terms.  
• Answer (B) is incorrect because The amount of $28,800 results from multiplying the contribution margin by the 20% interest rate.  
• Answer (C) is correct. The company can calculate the net benefit (loss) from the proposed change in credit policy as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in sales</td>
<td>$720,000</td>
</tr>
<tr>
<td>Times: variable cost ratio</td>
<td>× 80%</td>
</tr>
<tr>
<td>Increase in variable costs</td>
<td>$576,000</td>
</tr>
<tr>
<td>Increased investment in receivables</td>
<td>$120,000</td>
</tr>
<tr>
<td>= $576,000 × (75 days ÷ 360 days)</td>
<td></td>
</tr>
<tr>
<td>Increased investment in receivables</td>
<td>$120,000</td>
</tr>
<tr>
<td>Times: opportunity cost of funds</td>
<td>× 20%</td>
</tr>
<tr>
<td>Cost of new credit plan</td>
<td>$ 24,000</td>
</tr>
<tr>
<td>Increase in sales</td>
<td>$720,000</td>
</tr>
<tr>
<td>Times: contribution margin ratio</td>
<td>× 20%</td>
</tr>
<tr>
<td>Increase in contribution margin</td>
<td>$144,000</td>
</tr>
<tr>
<td>Less: cost of new credit plan</td>
<td>(24,000)</td>
</tr>
<tr>
<td>Benefit of new credit plan</td>
<td>$120,000</td>
</tr>
</tbody>
</table>

• Answer (D) is incorrect because The amount of $144,000 results from ignoring the costs incurred by having funds invested in receivables for 75 days.

Lawson Company has the opportunity to increase annual sales by $100,000 by selling to a new, riskier group of customers. Based on sales, the uncollectible expense is expected to be 15%, and collection costs will be 5%. The company’s manufacturing and selling expenses are 70% of sales, and its effective tax rate is 40%. If Lawson accepts this opportunity, the company’s after-tax profit will increase by

A. $4,000  
B. $6,000  
C. $9,000  
D. $10,000

• Answer (A) is incorrect because The amount of $4,000 is the tax expense on the increased income.
Answer (B) is correct. The company’s manufacturing and selling costs exclusive of bad debts equal 70% of sales. Hence, the gross profit on the $100,000 increase in sales will be $30,000 ($100,000 x 30%). The increase in after-tax profit is calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in gross profit</td>
<td>$30,000</td>
</tr>
<tr>
<td>Less: uncollectible accounts ($100,000 x 15%)</td>
<td>(15,000)</td>
</tr>
<tr>
<td>Less: collection costs ($100,000 x 5%)</td>
<td>(5,000)</td>
</tr>
<tr>
<td>Increase in pre-tax income</td>
<td>$10,000</td>
</tr>
<tr>
<td>Less: income tax expense ($10,000 x 40%)</td>
<td>(4,000)</td>
</tr>
<tr>
<td>Increase in after-tax income</td>
<td>$ 6,000</td>
</tr>
</tbody>
</table>

Answer (C) is incorrect because the amount of $9,000 does not include collection costs in calculating income.

Answer (D) is incorrect because the amount of $10,000 does not include the effect of taxes.

Parkison Company can increase annual sales by $150,000 if it sells to a new, riskier group of customers. The uncollectible accounts expense is expected to be 16% of sales, and collection costs will be 4%. The company’s manufacturing and selling expenses are 75% of sales, and its effective tax rate is 38%. If Parkison accepts this opportunity, its after-tax income will increase by

A. $2,850  
B. $4,650  
C. $7,500  
D. $8,370

- Answer (A) is incorrect because the amount of $2,850 is based on a 62% tax rate, the complement of the actual tax rate.
- Answer (B) is correct. The company’s manufacturing and selling costs exclusive of bad debts equal 75% of sales. Hence, the gross profit on the $150,000 increase in sales will be $37,500 ($150,000 x 25%). The increase in after-tax profit is calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in gross profit</td>
<td>$37,500</td>
</tr>
<tr>
<td>Less: uncollectible accounts ($150,000 x 16%)</td>
<td>(24,000)</td>
</tr>
<tr>
<td>Less: collection costs ($150,000 x 4%)</td>
<td>(6,000)</td>
</tr>
<tr>
<td>Increase in pre-tax income</td>
<td>$ 7,500</td>
</tr>
<tr>
<td>Less: income tax expense ($7,500 x 38%)</td>
<td>(2,850)</td>
</tr>
<tr>
<td>Increase in after-tax income</td>
<td>$ 4,650</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because the amount of $7,500 is the pretax income.
- Answer (D) is incorrect because the amount of $8,370 omits collection costs from the calculation.
[684] The following information regarding a change in credit policy was assembled by the Wilson Wax Company. The company has a required rate of return of 10% and a variable cost ratio of 60%.

<table>
<thead>
<tr>
<th>Old Credit Policy</th>
<th>New Credit Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$3,600,000</td>
</tr>
<tr>
<td>Average collection period</td>
<td>30 days</td>
</tr>
</tbody>
</table>

The pre-tax cost of carrying the additional investment in receivables, using a 360-day year, would be:

A. $960
B. $5,760
C. $8,160
D. $9,600

- Answer (A) is incorrect because the amount of $960 results from using a 10% variable cost ratio.
- Answer (B) is correct. The projected average balance in receivables under the old policy was $300,000 ($3,600,000 × (30 days ÷ 360 days)). Under the new policy, the average balance will be $396,000 ($3,960,000 × (36 days ÷ 360 days)). Hence, the average balance is $96,000 higher under the new policy ($396,000 – $300,000).

The pre-tax cost of carrying the additional investment in receivables can be calculated as follows:

\[
\text{Increased investment in receivables -- gross} = 96,000 \\
\times \text{variable cost ratio} = 60\% \\
\text{Increased investment in receivables -- net} = 57,600 \\
\times \text{opportunity cost of funds} = 10\% \\
\text{Incremental cost of new credit plan} = 5,760
\]

- Answer (C) is incorrect because the amount $8,160 is based on a differential between the average receivables balances of $136,000.
- Answer (D) is incorrect because the amount of $9,600 results from failing to adjust for the variable cost ratio.

[685] The following information regarding a change in credit policy was assembled by the Wilson Wax Company. The company has a required rate of return of 11% and a variable cost ratio of 50%. The opportunity cost of a longer collection period is assumed to be negligible.

<table>
<thead>
<tr>
<th>Old Credit Policy</th>
<th>New Credit Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$4,600,000</td>
</tr>
<tr>
<td>Average collection period</td>
<td>30 days</td>
</tr>
</tbody>
</table>

The pre-tax cost of carrying the additional investment in receivables, assuming a 360-day year, is:

A. $5,439
B. $10,878
C. $13,778
D. $98,890
• Answer (A) is correct. The projected average balance in receivables under the old policy was $383,333 \[($4,600,000 \times \frac{30 \text{ days}}{360 \text{ days}})\]. Under the new policy, the average balance will be $482,222 \[($4,960,000 \times \frac{35 \text{ days}}{360 \text{ days}})\]. Hence, the average balance is $98,889 higher under the new policy ($482,222 – $383,333). The pre-tax cost of carrying the additional investment in receivables can be calculated as follows:

<table>
<thead>
<tr>
<th>Increased investment in receivables -- gross</th>
<th>$98,889</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times: variable cost ratio</td>
<td>\times 50%</td>
</tr>
<tr>
<td>Increased investment in receivables -- net</td>
<td>$49,444</td>
</tr>
<tr>
<td>Times: opportunity cost of funds</td>
<td>\times 11%</td>
</tr>
<tr>
<td>Incremental cost of new credit plan</td>
<td>$5,439</td>
</tr>
</tbody>
</table>

• Answer (B) is incorrect because the amount of $10,878 results from failing to adjust for the proportion of incremental costs included in the additional receivables.

• Answer (C) is incorrect because the amount of $13,778 is the average daily sales under the new policy.

• Answer (D) is incorrect because the amount of $98,890 is the amount of the additional receivables.

Best Computers believes that its collection costs could be reduced through modification of collection procedures. This action is expected to result in a lengthening of the average collection period from 28 days to 34 days; however, there will be no change in uncollectible accounts. The company’s budgeted credit sales for the coming year are $27,000,000, and short-term interest rates are expected to average 8%. To make the changes in collection procedures cost beneficial, the minimum savings in collection costs (using a 360-day year) for the coming year would have to be

A. $30,000
B. $36,000
C. $180,000
D. $360,000

• Answer (A) is incorrect because the amount of $30,000 results from using a 5-day lengthening rather than a 6-day.

• Answer (B) is correct. If the change is adopted, Best’s average balance in receivables will increase by $450,000 \[($27,000,000 \times [(34 \text{ days} – 28 \text{ days}) \div 360 \text{ days}])\]. The minimum savings that Best must experience to justify the change is therefore $36,000 ($450,000 \times 8\%).

• Answer (C) is incorrect because the amount of $180,000 results from using 30 days rather than 6 days.

• Answer (D) is incorrect because the amount of $360,000 results from simply dividing annual sales by 6 days rather than weighting it for an entire year.

Hest Computers believes that its collection costs could be reduced through modification of collection procedures. This action is expected to result in a lengthening of the average collection period from 30 to 35 days; however, there will be no change in uncollectible accounts, or in total credit sales. Furthermore, the variable cost ratio is 60\%, the opportunity cost of a longer collection period is assumed to be negligible, the company’s budgeted credit sales for the coming year are $45,000,000, and the required rate of return is 6%. To justify changes in collection procedures, the minimum annual reduction of costs (using a 360-day year and ignoring taxes) must be

A. $22,500
B. $37,500
C. $125,000
D. $375,000
Answer (A) is correct. If the change is adopted, Hest’s average balance in receivables will increase by $625,000 ($45,000,000 [(35 days – 30 days) ÷ 360 days]). The company’s additional required investment in receivables is therefore $375,000 ($625,000 × 60% variable cost ratio), and the incremental pretax cost of this investment is $22,500 ($375,000 × 6%). Accordingly, the collection costs must be reduced by a pretax minimum of $22,500 to offset the cost of the increased investment in receivables.

Answer (B) is incorrect because this figure results from omitting the variable cost ratio from the calculation.

Answer (C) is incorrect because the average daily sales is $125,000.

Answer (D) is incorrect because this figure is the increased investment in receivables.

Clauson, Inc., grants credit terms of 1/15, net 30 and projects gross credit sales for the year of $2,000,000. The credit manager estimates that 40% of customers pay on the 15th day, 40% on the 30th day, and 20% on the 45th day. Assuming uniform sales and a 360-day year, what is the projected amount of overdue receivables?

A. $50,000
B. $16,667
C. $150,000
D. $400,000

Answer (A) is correct. The total amount of sales overdue at any time during the year is $400,000 ($2,000,000 gross credit sales × 20% received after 30 days). The average collection period for these sales is 45 days. The projected amount of overdue receivables is therefore $50,000 [$400,000 × (45 days ÷ 360 days)].

Answer (B) is incorrect because the amount of $16,667 results from using the 15 days of the overdue period rather than the entire 45 days.

Answer (C) is incorrect because the amount of $150,000 is the average total receivables at any time, not the overdue portion.

Answer (D) is incorrect because the amount of $400,000 is the total amount of sales that will be overdue at any time during the year.

Northville Products is changing its credit terms from net 30 to 2/10, net 30. The least likely effect of this change would be a(n)

A. Increase in sales.
B. Shortening of the cash conversion cycle.
C. Increase in short-term borrowings.
D. Lower number of days’ sales outstanding.

Answer (A) is incorrect because with a choice of credit terms, more customers are likely to buy.

Answer (B) is incorrect because encouraging customers to pay earlier shortens the cash conversion cycle.

Answer (C) is correct. Changing its credit terms to encourage earlier payment by customers increases the firm’s cash flow and decreases the need for short-term borrowing.

Answer (D) is incorrect because encouraging customers to pay earlier decreases the number of days’ sales outstanding.
[690] Snug-fit, a maker of bowling gloves, is investigating the possibility of liberalizing its credit policy. Currently, payment is made on a cash-on-delivery basis. Under a new program, sales would increase by $80,000. The company has a gross profit margin of 40%. The estimated bad debt loss rate on the incremental sales would be 6%. Ignoring the cost of money, what would be the return on sales before taxes for the new sales?

A. 34.0%
B. 36.2%
C. 40.0%
D. 42.5%

- **Answer (A) is correct.** The increase in estimated gross profit is $32,000 ($80,000 × 40%). The incremental bad debt loss is $4,800 ($80,000 × 6%). Accordingly, the estimated net increase in operating income is $27,200 ($32,000 – $4,800). The before-tax return on sales is 34% ($27,200 ÷ $80,000).

- **Answer (B) is incorrect** because the rate of 36.2% results from subtracting bad debt expense from the increase in operating income and the increase in gross sales.

- **Answer (C) is incorrect** because the rate of 40.0% results from failing to subtract the incremental bad debt loss.

- **Answer (D) is incorrect** because the rate of 42.5% is based on the assumption that the increase in operating income is $34,000 ($40,000 – $6,000 bad debt expense).

[691] A credit manager considering whether to grant trade credit to a new customer is most likely to place primary emphasis on

A. Profitability ratios.
B. Valuation ratios.
C. Growth ratios.
D. Liquidity ratios.

- **Answer (A) is incorrect** because equity investors are concerned with profitability ratios.

- **Answer (B) is incorrect** because equity investors are concerned with valuation ratios.

- **Answer (C) is incorrect** because equity investors are concerned with growth ratios.

- **Answer (D) is correct.** Liquidity is a firm’s ability to pay its short-term obligations as they come due. Trade payables are the most common form of short-term obligation. Thus, a credit manager is most interested in assessing a potential customer’s liquidity.
Foster Products is reviewing its trade credit policy with respect to the small retailers to which it sells. Four plans have been studied and the results are as follows:

<table>
<thead>
<tr>
<th>Plan</th>
<th>Revenue</th>
<th>Bad Debt</th>
<th>Collection Costs</th>
<th>Accounts Receivable</th>
<th>Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$200,000</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$20,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>B</td>
<td>250,000</td>
<td>3,000</td>
<td>2,000</td>
<td>40,000</td>
<td>50,000</td>
</tr>
<tr>
<td>C</td>
<td>300,000</td>
<td>6,000</td>
<td>5,000</td>
<td>60,000</td>
<td>60,000</td>
</tr>
<tr>
<td>D</td>
<td>350,000</td>
<td>12,000</td>
<td>8,000</td>
<td>80,000</td>
<td>70,000</td>
</tr>
</tbody>
</table>

The information shows how various annual expenses, such as bad debts and the cost of collections, change as sales change. The average balance of accounts receivable and inventory have also been projected. The cost of the product to Foster is 80% of the selling price, after-tax cost of capital is 15%, and Foster’s effective income tax rate is 30%. What is the optimal plan for Foster to implement?

A. Plan A.
B. Plan B.
C. Plan C.
D. Plan D.

- Answer (A) is incorrect because Plan A has a lower incremental profit than Plan B.
- Answer (B) is correct. The following schedule presents the after-tax profit for each plan:

<table>
<thead>
<tr>
<th>Plan</th>
<th>Plan A</th>
<th>Plan B</th>
<th>Plan C</th>
<th>Plan D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual revenue</td>
<td>$200,000</td>
<td>$250,000</td>
<td>$300,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>Times: GP percentage</td>
<td>× 20%</td>
<td>× 20%</td>
<td>× 20%</td>
<td>× 20%</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$40,000</td>
<td>$50,000</td>
<td>$60,000</td>
<td>$70,000</td>
</tr>
<tr>
<td>Less: bad debts</td>
<td>(1,000)</td>
<td>(3,000)</td>
<td>(6,000)</td>
<td>(12,000)</td>
</tr>
<tr>
<td>Less: collection costs</td>
<td>(1,000)</td>
<td>(2,000)</td>
<td>(5,000)</td>
<td>(8,000)</td>
</tr>
<tr>
<td>Gross incremental profit</td>
<td>$38,000</td>
<td>$45,000</td>
<td>$49,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Less: income taxes (30%)</td>
<td>(11,400)</td>
<td>(13,500)</td>
<td>(14,700)</td>
<td>(15,000)</td>
</tr>
<tr>
<td>After-tax profit</td>
<td>$26,600</td>
<td>$31,500</td>
<td>$34,300</td>
<td>$35,000</td>
</tr>
</tbody>
</table>

The following schedule presents the investment in current assets for each plan:

<table>
<thead>
<tr>
<th>Plan</th>
<th>Plan A</th>
<th>Plan B</th>
<th>Plan C</th>
<th>Plan D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts receivable</td>
<td>$20,000</td>
<td>$40,000</td>
<td>$60,000</td>
<td>$80,000</td>
</tr>
<tr>
<td>Inventory</td>
<td>40,000</td>
<td>50,000</td>
<td>60,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Capital invested</td>
<td>$60,000</td>
<td>$90,000</td>
<td>$120,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>Times: cost of capital</td>
<td>× 15%</td>
<td>× 15%</td>
<td>× 15%</td>
<td>× 15%</td>
</tr>
<tr>
<td>Dollar cost of capital</td>
<td>$9,000</td>
<td>$13,500</td>
<td>$18,000</td>
<td>$22,500</td>
</tr>
</tbody>
</table>

The difference between after-tax profit and cost of capital is the net incremental profit. Plan B’s is the highest:

<table>
<thead>
<tr>
<th>Plan</th>
<th>Plan A</th>
<th>Plan B</th>
<th>Plan C</th>
<th>Plan D</th>
</tr>
</thead>
<tbody>
<tr>
<td>After-tax profit</td>
<td>$26,600</td>
<td>$31,500</td>
<td>$34,300</td>
<td>$35,000</td>
</tr>
<tr>
<td>Less: dollar cost of capital</td>
<td>(9,000)</td>
<td>(13,500)</td>
<td>(18,000)</td>
<td>(22,500)</td>
</tr>
<tr>
<td>Net incremental profit</td>
<td>$17,600</td>
<td>$18,000</td>
<td>$16,300</td>
<td>$12,500</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because Plan C’s incremental profit is lower than Plan B’s.
- Answer (D) is incorrect because Plan D has the lowest incremental profit.
Computer Services is an established firm that sells computer hardware, software, and services. The firm is considering a change in its credit policy. It has been determined that such a change would not change the payment patterns of the current customers. To determine whether such a change would be beneficial, the firm has identified the proposed new credit terms, the expected additional sales, the expected contribution margin on the sales, the expected bad debt losses, and the investment in additional receivables and the period of the investment. What additional information, if any, does the firm require to determine the profitability of the proposed new policy as compared to the current credit policy?

A. The credit standards that presently exist.
B. The new credit standards.
C. The opportunity cost of funds.
D. No additional information is needed.

- Answer (A) is incorrect because The firm can determine the profitability of the current policy without regard to the credit standards.
- Answer (B) is incorrect because The new credit terms are known. The standards underlying them are irrelevant.
- Answer (C) is correct. Opportunity cost is the maximum benefit forgone by choosing an investment. Thus, the missing relevant information is the best alternative return on the funds to be invested in receivables.
- Answer (D) is incorrect because The firm needs to know the opportunity cost of funds.

Harson Products currently has a conservative credit policy and is in the process of reviewing three other credit policies. The current credit policy (Policy A) results in sales of $12 million per year. Policies B and C involve higher sales, accounts receivable and inventory balances, as well as higher bad debt and collection costs. Policy D grants longer payment terms than Policy C, but charges customers interest if they take advantage of the lengthy payment terms. The policies are outlined below:

<table>
<thead>
<tr>
<th>Policy ($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
</tr>
<tr>
<td>Average accounts receivable</td>
</tr>
<tr>
<td>Average inventory</td>
</tr>
<tr>
<td>Interest income</td>
</tr>
<tr>
<td>Bad debt expense</td>
</tr>
<tr>
<td>Collection cost</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>$12,000</td>
</tr>
<tr>
<td>1,500</td>
</tr>
<tr>
<td>2,000</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

If the direct cost of products is 80% of sales and the cost of short-term funds is 10%, what is the optimal policy for Harson?

A. Policy A.
B. Policy B.
C. Policy C.
D. Policy D.

- Answer (A) is incorrect because Policy A’s profit is lower than Policy B’s.
Answer (B) is correct. The following schedule presents the gross incremental profit for each policy:

<table>
<thead>
<tr>
<th>Sales</th>
<th>Policy A</th>
<th>Policy B</th>
<th>Policy C</th>
<th>Policy D</th>
</tr>
</thead>
<tbody>
<tr>
<td>$12,000,000</td>
<td>$13,000,000</td>
<td>$14,000,000</td>
<td>$14,000,000</td>
<td></td>
</tr>
<tr>
<td>Times: GP percentage</td>
<td>× 20%</td>
<td>× 20%</td>
<td>× 20%</td>
<td>× 20%</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$2,400,000</td>
<td>$2,600,000</td>
<td>$2,800,000</td>
<td>$2,800,000</td>
</tr>
<tr>
<td>Add: interest income</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>500,000</td>
</tr>
<tr>
<td>Less: bad debt expense</td>
<td>(100,000)</td>
<td>(125,000)</td>
<td>(300,000)</td>
<td>(400,000)</td>
</tr>
<tr>
<td>Less: collection costs</td>
<td>(100,000)</td>
<td>(125,000)</td>
<td>(250,000)</td>
<td>(350,000)</td>
</tr>
<tr>
<td>Gross incremental profit</td>
<td>$2,200,000</td>
<td>$2,350,000</td>
<td>$2,250,000</td>
<td>$2,550,000</td>
</tr>
</tbody>
</table>

The following schedule presents the dollar cost of capital for each policy:

<table>
<thead>
<tr>
<th>Avg. accounts receivable</th>
<th>Policy A</th>
<th>Policy B</th>
<th>Policy C</th>
<th>Policy D</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,500,000</td>
<td>$2,000,000</td>
<td>$3,500,000</td>
<td>$5,000,000</td>
<td></td>
</tr>
<tr>
<td>Avg. inventory</td>
<td>2,000,000</td>
<td>2,300,000</td>
<td>2,500,000</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Capital invested</td>
<td>$3,500,000</td>
<td>$4,300,000</td>
<td>$6,000,000</td>
<td>$7,500,000</td>
</tr>
<tr>
<td>Times: cost of capital</td>
<td>× 10%</td>
<td>× 10%</td>
<td>× 10%</td>
<td>× 10%</td>
</tr>
<tr>
<td>Dollar cost of capital</td>
<td>$350,000</td>
<td>$430,000</td>
<td>$600,000</td>
<td>$750,000</td>
</tr>
</tbody>
</table>

The difference between the gross incremental profit and the dollar cost of capital is the net incremental gross profit.

<table>
<thead>
<tr>
<th>Gross incremental profit</th>
<th>Policy A</th>
<th>Policy B</th>
<th>Policy C</th>
<th>Policy D</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2,200,000</td>
<td>$2,350,000</td>
<td>$2,250,000</td>
<td>$2,550,000</td>
<td></td>
</tr>
<tr>
<td>Less: dollar cost of capital</td>
<td>(350,000)</td>
<td>(430,000)</td>
<td>(600,000)</td>
<td>(750,000)</td>
</tr>
<tr>
<td>Net incremental gross profit</td>
<td>$1,850,000</td>
<td>$1,920,000</td>
<td>$1,650,000</td>
<td>$1,800,000</td>
</tr>
</tbody>
</table>

Thus, Policy B is the most profitable.

Answer (C) is incorrect because Policy C has the lowest profit.
Answer (D) is incorrect because Policy D’s profit is lower than Policy B’s.

[695] Locar Corporation had net sales last year of $18,600,000 (of which 20% were installment sales). It also had an average accounts receivable balance of $1,380,000. Credit terms are 2/10, net 30. Based on a 360-day year, Locar’s average collection period last year was

A. 26.2 days.
B. 26.7 days.
C. 27.2 days.
D. 33.4 days.

Answer (A) is incorrect because the amount of 26.2 days results from improperly adjusting accounts receivable for the 2% early-payment discount.
Answer (B) is correct. Average collection period equals average receivables divided by daily sales. Locar’s average daily sales were $51,666 ($18,600,000 ÷ 360). The average collection period was thus 26.7 days ($1,380,000 ÷ $51,666).
Answer (C) is incorrect because the amount of 27.2 days results from adding the 2% early-payment discount to the balance of accounts receivable.
Answer (D) is incorrect because the amount of 33.4 days results from improperly subtracting installment sales from annual net sales.
Powell Industries deals with customers throughout the country and is attempting to more efficiently collect its accounts receivable. A major bank has offered to develop and operate a lockbox system for Powell at a cost of $90,000 per year. Powell averages 300 receipts per day at an average of $2,500 each. Its short-term interest cost is 8% per year. Using a 360-day year, what reduction in average collection time would be needed in order to justify the lockbox system?

A. 0.67 days.
B. 1.20 days.
C. 1.25 days.
D. 1.50 days.

- Answer (A) is incorrect because the amount of 0.67 days results from reversing the order of division of the cost of the lockbox and the amount of float gained.
- Answer (B) is incorrect because the amount of 1.20 days results from multiplying by the number of days in the year rather than the number of payments per day, and dividing this amount by $60,000.
- Answer (C) is incorrect because the amount of 1.25 days results from multiplying by the number of days in the year rather than the number of payments per day.
- Answer (D) is correct. The amount Powell could potentially earn by investing its cash collections is calculated as follows:

Average amount per transaction $2,500
Times: payments per day \(\times\) 300
Daily collections $750,000
Times: money market rate \(\times\) 8%
Potential return on daily collections $60,000

The reduction in average collection time that justifies the lockbox system is the ratio of its cost to the potential return ($90,000 ÷ $60,000 = 1.5 days).

Consider the following factors affecting a company as it is reviewing its trade credit policy.

I. Operating at full capacity.
II. Low cost of borrowing.
III. Opportunity for repeat sales.
IV. Low gross margin per unit.

Which of the above factors would indicate that the company should liberalize its credit policy?

A. I and II only.
B. I, II, and III only.
C. II and III only.
D. III and IV only.

- Answer (A) is incorrect because if the firm is operating at full capacity, it is selling all it can produce and has no need to loosen its credit policies.
- Answer (B) is incorrect because if the firm is operating at full capacity, it is selling all it can produce and has no need to loosen its credit policies.
- Answer (C) is correct. If the cost of borrowing is low, the firm can satisfy its working capital needs otherwise than by encouraging early payment from customers. Also, loosening credit policies tends to increase repeat sales.
- Answer (D) is incorrect because if the gross margin per unit is low, greater sales will not significantly improve the firm’s profits.
The Philadelphia Corporation has been advised by its accountant, Phyllis Brown, that the following four sales volumes could be achieved along with the following receivable payment patterns and bad debts, depending on the company’s credit policy (in thousands).

<table>
<thead>
<tr>
<th>Sales Volume</th>
<th>30 Days</th>
<th>60 Days</th>
<th>90 Days</th>
<th>120 Days</th>
<th>Bad Debts</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. 520</td>
<td>300</td>
<td>100</td>
<td>$0</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>II. 630</td>
<td>200</td>
<td>200</td>
<td>100</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>III. 770</td>
<td>200</td>
<td>100</td>
<td>20</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>IV. 900</td>
<td>100</td>
<td>200</td>
<td>300</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Assuming that the firm’s cost of capital is 20% and that all payments are made on the first possible day of the aging month, which sales volume will maximize profit?

A. I.
B. II.
C. III.
D. IV.

- Answer (A) is incorrect because the sales volume is less than the income generated under IV.
- Answer (B) is incorrect because decreased bad debt expense does not justify the decrease in sales.
- Answer (C) is incorrect because income could be further maximized with a loosened credit policy.
- Answer (D) is correct. The optimal credit strategy is one that maximizes sales while minimizing bad debt expense and collection time. Although IV has the highest bad debt expense and collects less money earlier, it results in the highest amount of sales, enough to offset the increased cost of bad debt and collection time. The total income from each policy is found by subtracting the imputed financing charge for each month of uncollected receivables and bad debt expense from the total sales, in this case totaling $775, determined as follows: $900 – ($200 × 20% ÷ 12) – ($200 × 2 × 20% ÷ 12) – ($300 × 20% ÷ 12 × 3) – $100 = $775.

The optimal level of inventory is affected by all of the following except the

A. Usage rate of inventory per time period.
B. Cost per unit of inventory.
C. Current level of inventory.
D. Cost of placing an order for merchandise.

- Answer (A) is incorrect because the usage rate of inventory is a factor in determining how much inventory to carry.
- Answer (B) is incorrect because the cost of inventory affects carrying costs and a firm wants to minimize its inventory carrying costs.
- Answer (C) is correct. The optimal level of inventory is affected by the factors in the economic order quantity (EOQ) model and delivery or production lead times. These factors are the annual demand for inventory, the carrying cost, which includes the interest on funds invested in inventory, the usage rate, and the cost of placing an order or making a production run. The current level of inventory has nothing to do with the optimal inventory level.
- Answer (D) is incorrect because the cost of placing an order affects how often orders are placed. A firm wants to minimize its ordering costs.
Which one of the following would not be considered a carrying cost associated with inventory?

A. Insurance costs.
B. Cost of capital invested in the inventory.
C. Cost of obsolescence.
D. Shipping costs.

- Answer (A) is incorrect because Insurance is a cost of carrying inventory.
- Answer (B) is incorrect because Invested capital is a cost of carrying inventory.
- Answer (C) is incorrect because Obsolescence is a cost of carrying inventory.
- Answer (D) is correct. Carrying costs are incurred to hold inventory. Examples include such costs as warehousing, insurance, the cost of capital invested in inventories, inventory taxes, and the cost of obsolescence and spoilage. Neither shipping costs nor the initial cost of the inventory are carrying costs.

An example of a carrying cost is

A. Disruption of production schedules.
B. Quantity discounts lost.
C. Handling costs.
D. Spoilage.

- Answer (A) is incorrect because Disruption of production schedules may result from a stockout.
- Answer (B) is incorrect because Quantity discounts lost are related to ordering costs or inventory acquisition costs.
- Answer (C) is incorrect because Shipping and handling costs are included in acquisition costs.
- Answer (D) is correct. Inventory costs consist of four categories: purchase costs, order or set-up costs, carrying (holding) costs, and stockout costs. Carrying costs include storage costs for inventory items plus opportunity cost (i.e., the cost incurred by investing in inventory rather than making an income-earning investment). Examples are insurance, spoilage, interest on invested capital, obsolescence, and warehousing costs.

The carrying costs associated with inventory management include

A. Insurance costs, shipping costs, storage costs, and obsolescence.
B. Storage costs, handling costs, capital invested, and obsolescence.
C. Purchasing costs, shipping costs, set-up costs, and quantity discounts lost.
D. Obsolescence, set-up costs, capital invested, and purchasing costs.

- Answer (A) is incorrect because Shipping costs are ordering costs, not carrying costs.
- Answer (B) is correct. Carrying costs include storage costs, handling costs, insurance costs, interest on capital invested, and obsolescence.
- Answer (C) is incorrect because It states various ordering (or manufacturing) costs.
- Answer (D) is incorrect because The set-up costs for a production run are equivalent to ordering costs. Additionally, purchasing costs are considered costs of ordering.
The ordering costs associated with inventory management include

A. Insurance costs, purchasing costs, shipping costs, and spoilage.
B. Obsolescence, setup costs, quantity discounts lost, and storage costs.
C. Purchasing costs, shipping costs, setup costs, and quantity discounts lost.
D. Shipping costs, obsolescence, setup costs, and capital invested.

- Answer (A) is incorrect because Insurance costs are a carrying cost.
- Answer (B) is incorrect because Obsolescence, spoilage, interest on invested capital, and storage costs are carrying costs.
- Answer (C) is correct. Ordering costs are costs incurred when placing and receiving orders. Ordering costs include purchasing costs, shipping costs, setup costs for a production run, and quantity discounts lost.
- Answer (D) is incorrect because Obsolescence, spoilage, interest on invested capital, and storage costs are carrying costs.

A major supplier has offered Alpha Corporation a year-end special purchase whereby Alpha could purchase 180,000 cases of sport drink at $10 per case. Alpha normally orders 30,000 cases per month at $12 per case. Alpha’s cost of capital is 9%. In calculating the overall opportunity cost of this offer, the cost of carrying the increased inventory would be

A. $32,400
B. $40,500
C. $64,800
D. $81,000

- Answer (A) is correct. If Alpha makes the special purchase of 6 months of inventory (180,000 cases ÷ 30,000 cases per month), the average inventory for the 6-month period will be $900,000 [(180,000 × $10) ÷ 2]. If the special purchase is not made, the average inventory for the same period will be the average monthly inventory of $180,000 [(30,000 × $12) ÷ 2]. Accordingly, the incremental average inventory is $720,000 ($900,000 – $180,000), and the interest cost of the incremental 6-month investment is $32,400 [($720,000 × 9%) ÷ 2].
- Answer (B) is incorrect because The amount of $40,500 is the result of assuming an incremental average inventory of $900,000.
- Answer (C) is incorrect because The interest cost for 12 months is $64,800.
- Answer (D) is incorrect because The amount of $81,000 is the result of assuming an incremental average inventory of $900,000 and a 12-month period.

All of the following are inventory carrying costs except

A. Storage.
B. Insurance.
C. Opportunity cost of inventory investment.
D. Inspections.

- Answer (A) is incorrect because Storage and obsolescence and spoilage are inventory holding costs.
- Answer (B) is incorrect because Insurance and obsolescence and spoilage are inventory holding costs.
- Answer (C) is incorrect because Opportunity cost of inventory investment, and obsolescence and spoilage are inventory holding costs.
Answer (D) is correct. Inventory carrying costs are incurred to hold inventory. Examples include the costs of storage, insurance, security, inventory taxes, depreciation or rent of warehouse facilities, obsolescence and spoilage, and the opportunity cost of inventory investment. Inspection costs are not related to the length of time inventory is held. They are costs of taking delivery and are best classified as ordering costs.

[706] The following information regarding inventory policy was assembled by the JRJ Corporation. The company uses a 50-week year in all calculations.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>10,000 units per year</td>
</tr>
<tr>
<td>Order quantity</td>
<td>2,000 units</td>
</tr>
<tr>
<td>Safety stock</td>
<td>1,300 units</td>
</tr>
<tr>
<td>Lead time</td>
<td>4 weeks</td>
</tr>
</tbody>
</table>

The reorder point is

A. 3,300 units.
B. 2,100 units.
C. 1,300 units.
D. 800 units.

- Answer (A) is incorrect because this number of units is the sum of the order quantity units plus the safety stock in units.
- Answer (B) is correct. The reorder point is the inventory level at which an order should be placed. It can be quantified using the following equation:

\[
\text{Reorder point} = \left( \frac{\text{Average weekly demand} \times \text{Lead time}}{50 \text{ weeks}} \right) + \text{Safety stock}
\]

\[
= \left( \frac{10,000 \text{ units} \div 50 \text{ weeks}}{50 \text{ weeks}} \right) \times 4 \text{ weeks} + 1,300 \text{ units}
\]

\[
= 800 \text{ units} + 1,300 \text{ units}
\]

\[
= 2,100 \text{ units}
\]

- Answer (C) is incorrect because this number of units equals the units of safety stock required.
- Answer (D) is incorrect because this number of units does not include the safety stock.

[707] The following information regarding inventory policy was assembled by the TKF Corporation. The company uses a 50-week year in all calculations.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>12,000 units per year</td>
</tr>
<tr>
<td>Order quantity</td>
<td>4,000 units</td>
</tr>
<tr>
<td>Safety stock</td>
<td>1,500 units</td>
</tr>
<tr>
<td>Lead time</td>
<td>5 weeks</td>
</tr>
</tbody>
</table>

The reorder point is

A. 5,500 units.
B. 2,700 units.
C. 1,200 units.
D. 240 units.

- Answer (A) is incorrect because this number of units equals the order size plus the safety stock.
- Answer (B) is correct. The reorder point is the inventory level at which an order should be placed. It can be quantified using the following equation:

\[
\text{Reorder point} = (\text{Average weekly demand} \times \text{Lead time}) + \text{Safety stock}
\]

\[
= \left(\frac{12,000 \text{ units}}{50 \text{ weeks}} \times 5 \text{ weeks}\right) + 1,500 \text{ units}
\]

\[
= 1,200 \text{ units} + 1,500 \text{ units}
\]

\[
= 2,700 \text{ units}
\]

- Answer (C) is incorrect because this number of units omits safety stock.
- Answer (D) is incorrect because this number of units is the average weekly usage.

[708] In inventory management, the safety stock will tend to increase if the

A. Carrying cost increases.
B. Cost of running out of stock decreases.
C. Variability of the lead time increases.
D. Variability of the usage rate decreases.

- Answer (A) is incorrect because an increase in inventory carrying costs makes it less economical to carry safety stocks.
- Answer (B) is incorrect because if the cost of stockouts declines, the incentive to carry large safety stocks is reduced.
- Answer (C) is correct. A company maintains safety stocks to protect itself against the losses caused by stockouts. These can take the form of lost sales or lost production time. Safety stock is necessary because of the variability in lead time and usage rates. As the variability in lead time increases, a company will tend to carry larger safety stocks.
- Answer (D) is incorrect because a decline in the variability of usage makes it easier to plan orders, and safety stocks will be less necessary.

[709] The level of safety stock in inventory management depends on all of the following except the

A. Level of uncertainty of the sales forecast.
B. Level of customer dissatisfaction for back orders.
C. Cost of running out of inventory.
D. Cost to reorder stock.

- Answer (A) is incorrect because the variability of sales during the lead time is a factor in the size of safety stocks.
- Answer (B) is incorrect because the cost of stockouts, including the opportunity cost of customer dissatisfaction, is considered in determining safety stock.
- Answer (C) is incorrect because the cost of running out of inventory, often an opportunity cost, is a consideration.
- Answer (D) is correct. Determining the appropriate level of safety stock involves a complex probabilistic calculation that balances (1) the variability of demand for the good, (2) the variability in lead time, and (3) the level of risk the firm is willing to accept of having to incur stockout costs. Thus, the only one of the items listed that does not affect the level of safety stock is reorder costs.
Handy operates a chain of hardware stores across Ohio. The controller wants to determine the optimum safety stock levels for an air purifier unit. The inventory manager compiled the following data:

- The annual carrying cost of inventory approximates 20% of the investment in inventory.
- The inventory investment per unit averages $50.
- The stockout cost is estimated to be $5 per unit.
- The company orders inventory on the average of 10 times per year.
- Total cost = carrying cost + expected stockout cost.
- The probabilities of a stockout per order cycle with varying levels of safety stock are as follows:

<table>
<thead>
<tr>
<th>Units</th>
<th>Safety Stock</th>
<th>Resulting Stockout</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>0</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>0</td>
<td>100</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>0</td>
<td>200</td>
<td>12%</td>
<td>12%</td>
</tr>
</tbody>
</table>

The total cost of safety stock on an annual basis with a safety stock level of 100 units is

A. $1,750  
B. $1,950  
C. $550  
D. $2,000

- Answer (A) is correct. The cost of safety stock is given as carrying cost plus expected stockout cost. At 20% of the $50 unit inventory cost, carrying cost is $10 per unit per year. Thus, carrying cost for 100 units of safety stock is $1,000. A stockout has a 15% probability at this level of safety stock, and stockout costs are $500 (100 × $5) for each occurrence. If the firm orders 10 times per year, the expected number of stockouts is 1.5 (15% × 10). Hence, total expected stockout cost for the year is $750 ($500 × 1.5). Total cost is $1,750 per year ($1,000 + $750).
- Answer (B) is incorrect because The amount of $1,950 is the sum of the expected stockout costs for stockouts of 100 units and 200 units.
- Answer (C) is incorrect because The carrying cost alone is $10 per unit, or $1,000 per year.
- Answer (D) is incorrect because The amount of $2,000 is the carrying cost of 200 units of safety stock.

A company serves as a distributor of products by ordering finished products once a quarter and using that inventory to accommodate the demand over the quarter. If it plans to ease its credit policy for customers, the amount of products ordered for its inventory every quarter will be

A. Increased to accommodate higher sales levels.  
B. Reduced to offset the increased cost of carrying accounts receivable.  
C. Unaffected if safety stock is part of the current quarterly order.  
D. Unaffected if the JIT inventory control system is used.

- Answer (A) is correct. Relaxing the credit policy for customers will lead to increased sales because more people will be eligible for more credit. As sales increase, purchase orders will increase to accommodate the higher sales levels.
- Answer (B) is incorrect because Inventory should be increased to accommodate higher sales levels.
- Answer (C) is incorrect because Safety stock is based on expected sales, which are expected to rise.
- Answer (D) is incorrect because A just-in-time system is not used when a company orders inventory once a quarter.
The amount of inventory that a company would tend to hold in safety stock would increase as the sales level falls to a permanently lower level. A. Cost of carrying inventory decreases. B. Variability of sales decreases. C. Cost of running out of stock decreases. D. Answer (A) is incorrect because lower demand reduces the possibility of a stockout. Hence, the firm can carry a lower level of safety stock. Answer (B) is correct. A firm's economic order quantity is a function of demand, carrying costs, and ordering costs. A decrease in carrying costs permits a company to carry more inventory at the same cost and thereby reduce stockout costs. Answer (C) is incorrect because if demand can be predicted with greater accuracy, a stockout is less likely and safety stock can be reduced. Answer (D) is incorrect because if carrying cost is constant, a reduction in the cost of a stockout justifies a smaller safety stock.

The result of the economic order quantity (EOQ) formula indicates the
A. Annual quantity of inventory to be carried.
B. Annual usage of materials during the year.
C. Safety stock plus estimated inventory for the year.
D. Quantity of each individual order during the year.

Answer (A) is incorrect because the annual quantity of inventory demanded is an input into the formula, not the result. Answer (B) is incorrect because annual usage is a determinant of annual demand, which is an input into the formula. Answer (C) is incorrect because safety stock is not reflected in the basic EOQ formula. Answer (D) is correct. The EOQ model is a deterministic model that calculates the ideal order (or production lot) quantity given specified demand, ordering or setup costs, and carrying costs. The model minimizes the sum of inventory carrying costs and either ordering or production setup costs.

The Stewart Co. uses the economic order quantity (EOQ) model for inventory management. A decrease in which one of the following variables would increase the EOQ?
A. Annual sales.
B. Cost per order.
C. Safety stock level.
D. Carrying costs.

Answer (A) is incorrect because a decrease in demand (annual sales), which is in the numerator, will decrease the EOQ. Answer (B) is incorrect because a decrease in ordering costs will encourage more orders, or a decrease in the EOQ. Answer (C) is incorrect because a decrease in safety stock levels will not affect the EOQ, although it might lead to a different ordering point.
**Answer (D) is correct.** The EOQ model minimizes the total of ordering and carrying costs. The EOQ is calculated as follows:

\[
\text{EOQ} = \sqrt{\frac{2 \times \text{Demand} \times \text{Order costs}}{\text{Carrying costs per unit}}}
\]

Increases in the numerator (demand or ordering costs) will increase the EOQ, whereas decreases in demand or ordering costs will decrease the EOQ. Similarly, a decrease in the denominator (carrying costs) will increase the EOQ.

[715] Edwards Manufacturing Corporation uses the standard economic order quantity (EOQ) model. If the EOQ for Product A is 200 units and Edwards maintains a 50-unit safety stock for the item, what is the average inventory of Product A?

A. 250 units.
B. 150 units.
C. 125 units.
D. 100 units.

- **Answer (A) is incorrect** because the maximum inventory level is 250 units.
- **Answer (B) is correct.** If safety stock is 50 units, the receipt of an order should increase the inventory to 250. That amount will decline to 50 just prior to the receipt of the next order. Thus, the average inventory would be the average of 250 and 50 \((250 + 50) ÷ 2\), or 150 units.
- **Answer (C) is incorrect** because this figure assumes an EOQ of 250 units and no safety stock.
- **Answer (D) is incorrect** because this figure assumes no safety stock.

[716] The economic order quantity for a product is 500 units. However, new orders require 4 working-days lead time during which 80 units will be used. Given this information, the correct economic order quantity is

A. 420 units.
B. 500 units.
C. 509 units.
D. 580 units.

- **Answer (A) is incorrect** because the lead time does not affect the amount of EOQ.
- **Answer (B) is correct.** The lead times do not affect the EOQ; it just means the order should be placed four days earlier.
- **Answer (C) is incorrect** because the lead time does not affect the amount of EOQ.
- **Answer (D) is incorrect** because the lead time does not affect the amount of EOQ.

[717] When the economic order quantity (EOQ) model is used for a firm that manufactures its inventory, ordering costs consist primarily of

A. Insurance and taxes.
B. Obsolescence and deterioration.
C. Storage and handling.
D. Production set-up.

- **Answer (A) is incorrect** because insurance and taxes are carrying costs.
Answer (B) is incorrect because Obsolescence and deterioration are carrying costs.
Answer (C) is incorrect because Storage and handling are carrying costs.
Answer (D) is correct. A manufacturer can use the EOQ model by substituting production set-up costs for ordering costs. Set-up costs are the manufacturer’s equivalent of ordering costs. The result is sometimes referred to as the economic batch quantity.

An inventory management technique designed to minimize inventory investment by having materials arrive at the time they are needed for use is known as

A. The economic order quantity model (EOQ).
B. Materials requirements planning (MRP).
C. First-in first-out (FIFO).
D. Just-in-time (JIT).

Answer (A) is incorrect because The economic order quantity (EOQ) model is an inventory management approach used to minimize the sum of ordering and carrying costs.
Answer (B) is incorrect because A materials requirements planning (MRP) system enables a company to efficiently fulfill the requirements of the master production schedule by coordinating both the manufacture of component parts for finished goods and the arrival of raw materials necessary to create the intermediate components.
Answer (C) is incorrect because First-in first-out (FIFO) is an inventory cost flow assumption that assumes that the first goods purchased are the first sold.
Answer (D) is correct. A just-in-time (JIT) inventory management system limits the output of each manufacturing operation to the demand of the next operation. Shipment of raw materials from vendors are scheduled to arrive “just in time” to be used in the production process. Inventory storage is considered a nonvalue-adding activity, and raw materials on hand are thus kept to a minimum.

Atlantic Distributors is expanding and wants to increase its level of inventory to support an aggressive sales target. They would like to finance this expansion using debt. Atlantic currently has loan covenants that require the working capital ratio to be at least 1.2. The average cost of the current liabilities is 12%, and the cost of the long-term debt is 8%. Below is the current balance sheet for Atlantic.

| Current assets | $200,000 | Current liabilities | $165,000 |
| Fixed assets   | 100,000  | Long-term debt      | 100,000  |
|                |          | Equity               | 35,000   |
| Total assets   | $300,000 | Total debt & equity  | $300,000 |

Which one of the following alternatives will provide the resources to expand the inventory while lowering the total cost of debt and satisfying the loan covenant?

A. Increase both accounts payable and inventory by $25,000.
B. Sell fixed assets with a book value of $20,000 for $25,000, and use the proceeds to increase inventory.
C. Borrow short-term funds of $25,000, and purchase inventory of $25,000.
D. Collect $25,000 accounts receivable, use $10,000 to purchase inventory, and use the balance to reduce short-term debt.

Answer (A) is incorrect because Increasing accounts payable and inventory by $25,000 reduces the working capital ratio to 1.18.
Answer (B) is incorrect because Converting fixed assets to cash does not affect the total cost of debt.
Answer (C) is incorrect because Increasing current liabilities and inventory by $25,000 reduces the working capital ratio to 1.18.

Answer (D) is correct. Of the $25,000 collected, $10,000 is converted to another current asset (inventory), and the remaining $15,000 reduces current liabilities. The net result is to raise the working capital ratio to 1.23 ($185,000 ÷ $150,000) and lower the total cost of debt. Liabilities are a smaller part of the capital structure.

[720] All of the following are carrying costs of inventory except

A. Storage costs.
B. Insurance.
C. Shipping costs.
D. Opportunity costs.

- Answer (A) is incorrect because The cost of storing inventory is a carrying cost.
- Answer (B) is incorrect because The cost of insurance is a carrying cost.
- Answer (C) is correct. The cost of shipping inventory is a cost of acquiring, not carrying, it.
- Answer (D) is incorrect because The opportunity cost of the funds invested in inventory is a carrying cost.

[721] Valley, Inc., uses 400 lbs. of a rare isotope per year. The isotope costs $500 per lb., but the supplier is offering a quantity discount of 2% for order sizes between 30 and 79 lbs. and a 6% discount for order sizes of 80 lbs. or more. The ordering costs are $200. Carrying costs are $100 per lb. of material and are not affected by the discounts. If the purchasing manager places eight orders of 50 lbs. each, the total cost of ordering and carrying inventory, including discounts lost, will be

A. $1,600
B. $4,100
C. $6,600
D. $12,100

- Answer (A) is incorrect because The amount of $1,600 equals the ordering costs.
- Answer (B) is incorrect because The amount of $4,100 results from excluding the discounts lost.
- Answer (C) is incorrect because The amount of $6,600 results from using the highest rather than the average inventory and from excluding the discounts lost.
- Answer (D) is correct. Valley’s annual ordering costs are $1,600 ($200 per order × 8 orders per year), and the annual carrying costs are $2,500 ($100 per pound × 25 pounds average inventory). Gross annual product purchase cost is $200,000 ($500 per pound × 400 pounds annual usage). Because the differential discount lost is 4% (6% – 2%), annual discounts lost equal $8,000 ($200,000 × 4%). If the purchasing manager places 8 orders of 50 pounds each, Valley’s total cost can be calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual ordering costs</td>
<td>$1,600</td>
</tr>
<tr>
<td>Annual carrying costs</td>
<td>2,500</td>
</tr>
<tr>
<td>Annual discounts lost</td>
<td>8,000</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>$12,100</strong></td>
</tr>
</tbody>
</table>
A review of the inventories of Cedar Grove Company shows the following cost data for entertainment centers.

<table>
<thead>
<tr>
<th>Cost Data</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invoice price</td>
<td>$400.00</td>
</tr>
<tr>
<td>Freight and insurance on shipment</td>
<td>$20.00</td>
</tr>
<tr>
<td>Insurance on inventory</td>
<td>$15.00</td>
</tr>
<tr>
<td>Unloading</td>
<td>$140.00</td>
</tr>
<tr>
<td>Cost of placing orders</td>
<td>$10.00</td>
</tr>
<tr>
<td>Cost of capital</td>
<td>25%</td>
</tr>
</tbody>
</table>

What are the total carrying costs of inventory for an entertainment center?

A. $105
B. $115
C. $120
D. $420

- Answer (A) is incorrect because the amount of $105 results from excluding the cost of insurance.
- Answer (B) is incorrect because the amount of $115 results from excluding the cost of freight and insurance on shipment.
- Answer (C) is correct. The cost of carrying a unit of inventory can be calculated as follows:

\[
\text{Per-unit purchase cost} = \text{Invoice price} \times \text{Cost of capital} = 400 \times 0.25 = 100
\]
\[
\text{Opportunity cost} = \text{Per-unit purchase cost} \times \text{Cost of capital} = 100 \times 0.25 = 25
\]
\[
\text{Per-unit carrying cost} = \text{Per-unit purchase cost} + \text{Opportunity cost} = 100 + 25 = 125
\]

- Answer (D) is incorrect because the amount of $420 is the per-unit cost of purchase.

Paint Corporation expects to use 48,000 gallons of paint per year costing $12 per gallon. Inventory carrying cost is equal to 20% of the purchase price. The company uses its inventory at a constant rate. The lead time for placing the order is 3 days, and Paint Corporation holds 2,400 gallons of paint as safety stock. If the company orders 2,000 gallons of paint per order, what is the cost of carrying inventory?

A. $2,400
B. $5,280
C. $5,760
D. $8,160

- Answer (A) is incorrect because the amount of $2,400 results from excluding the carrying cost of safety stock.
- Answer (B) is incorrect because the amount of $5,280 results from averaging the safety stock.
- Answer (C) is incorrect because the amount of $5,760 results from excluding the carrying cost of the average inventory.
- Answer (D) is correct. Paint’s per-gallon carrying cost is $2.40 ($12 purchase price per gallon \times 20\% carrying cost). The cost of carrying safety stock is $5,760 (2,400 gallons \times $2.40), and the cost of carrying average inventory is $2,400 (1,000 gallons \times $2.40). Thus, total inventory carrying cost is $8,160 ($5,760 + $2,400).
James Smith is the new manager of inventory at American Electronics, a major retailer. He is developing an inventory control system and knows he should consider establishing a safety stock level. The safety stock can protect against all of the following risks except for the possibility that

A. Customers cannot find the merchandise they want, and they will go to the competition.
B. Shipments of merchandise from the manufacturers is delayed by as much as 1 week.
C. The distribution of daily sales will have a large variance due to holidays, weather, advertising, and weekly shopping habits.
D. New competition may open in the company's market area.

- Answer (A) is incorrect because One of the purposes of holding safety stock is to be able to fill all customer orders.
- Answer (B) is incorrect because One of the purposes of holding safety stock is to protect against outages caused by shipping delays from the supplier.
- Answer (C) is incorrect because One of the purposes of holding safety stock is as a hedge against fluctuations in demand.
- Answer (D) is correct. Safety stock cannot protect against the entry of new competitors.

Ferndale Distributors is reviewing its inventory policy with respect to safety stocks of its most popular product. Four safety stock levels were analyzed and annual stockout costs estimated for each level.

<table>
<thead>
<tr>
<th>Safety Stock</th>
<th>Stockout Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 units</td>
<td>$3,000</td>
</tr>
<tr>
<td>1,250 units</td>
<td>2,000</td>
</tr>
<tr>
<td>1,500 units</td>
<td>1,000</td>
</tr>
<tr>
<td>2,000 units</td>
<td>0</td>
</tr>
</tbody>
</table>

The cost of this product is $20 per unit, holding costs are 4% per year, and the cost of short-term funds is 10% per year. What is the optimal safety stock level?

A. 1,000 units.
B. 1,250 units.
C. 1,500 units.
D. 2,000 units.

- Answer (A) is incorrect because The amount of 1,000 units results in a higher cost than holding 1,500 units.
- Answer (B) is incorrect because The amount of 1,250 units results in a higher cost than holding 1,500 units.
- Answer (C) is correct.

<table>
<thead>
<tr>
<th></th>
<th>1,000</th>
<th>1,250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price</td>
<td>$20</td>
<td>$20</td>
</tr>
<tr>
<td>Times: safety stock level</td>
<td>$20,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>Times: cost of capital</td>
<td>$2,000</td>
<td>$2,500</td>
</tr>
<tr>
<td>Total cost of safety stock</td>
<td>$5,800</td>
<td>$5,500</td>
</tr>
</tbody>
</table>

- Answer (D) is incorrect because the amount of 2,000 units results in a higher cost than holding 1,500 units.

---

**Carnes Industries** uses the economic order quantity (EOQ) model as part of its inventory control program. An increase in which one of the following variables would increase the EOQ?

A. Carrying cost rate.
B. Purchase price per unit.
C. Ordering costs.
D. Safety stock level.

- Answer (A) is incorrect because Carrying cost is in the denominator of the EOQ fraction. An increase results in a decrease in the EOQ.
- Answer (B) is incorrect because The purchase price has no effect on the EOQ.
- Answer (C) is correct. Fixed cost per order is in the numerator of the EOQ fraction. An increase results in an increase in the EOQ.
- Answer (D) is incorrect because Decisions about the level of safety stock do not affect the EOQ.
Which one of the following is not explicitly considered in the standard calculation of economic order quantity (EOQ)?

A. Level of sales.
B. Fixed ordering costs.
C. Carrying costs.
D. Quantity discounts.

- Answer (A) is incorrect because Periodic demand in units is in the numerator of the EOQ fraction.
- Answer (B) is incorrect because Order costs are in the numerator of the EOQ fraction.
- Answer (C) is incorrect because Carrying costs are in the denominator of the EOQ fraction.
- Answer (D) is correct. Quantity discounts are not a factor in the EOQ formula.

Which one of the following statements concerning the economic order quantity (EOQ) is correct?

A. The EOQ results in the minimum ordering cost and minimum carrying cost.
B. Increasing the EOQ is the best way to avoid stockouts.
C. The EOQ model assumes constantly increasing usage over the year.
D. The EOQ model assumes that order delivery times are consistent.

- Answer (A) is incorrect because The EOQ formula minimizes the sum of ordering costs and carrying costs.
- Answer (B) is incorrect because The EOQ formula concerns ordering and carrying costs. It does not explicitly consider stockouts.
- Answer (C) is incorrect because One of the underlying assumptions of the EOQ model is that demand is constant throughout the year.
- Answer (D) is correct. One of the underlying assumptions of the EOQ model is that delivery times are predictably consistent. Other assumptions are that sales are perfectly predictable and that usage is constant.

Assume that the following inventory values are determined to be appropriate for Louger Company:

<table>
<thead>
<tr>
<th>Sales</th>
<th>1,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying costs</td>
<td>20% of inventory value</td>
</tr>
<tr>
<td>Purchase price</td>
<td>$10 per unit</td>
</tr>
<tr>
<td>Cost per order</td>
<td>$10</td>
</tr>
</tbody>
</table>

What is the economic order quantity (EOQ) for Louger?

A. 45 units.
B. 100 units.
C. 141 units.
D. 1,000 units.

- Answer (A) is incorrect because The amount of 45 units results in a higher total cost (carrying costs plus ordering costs) than quantities of 100.
• Answer (B) is correct.

\[
\text{EOQ} = \text{Sq. root } \left( \frac{2 \times \text{fixed order cost} \times \text{periodic demand}}{\text{unit carrying cost}} \right) \\
= \text{Sq. root } \left( \frac{2 \times $10 \times 1,000 \text{ units}}{($10 \times 20\%)} \right) \\
= \text{Sq. root } ($20,000 \div $2) \\
= \text{Sq. root } (10,000) \\
= 100 \text{ units}
\]

• Answer (C) is incorrect because the amount of 141 units results in a higher total cost (carrying costs plus ordering costs) than quantities of 100.

• Answer (D) is incorrect because the amount of 1,000 units results in a higher total cost (carrying costs plus ordering costs) than quantities of 100.

[730] Which one of the following provides a spontaneous source of financing for a firm?

A. Accounts payable.
B. Mortgage bonds.
C. Accounts receivable.
D. Debentures.

• Answer (A) is correct. Trade credit is a spontaneous source of financing because it arises automatically as part of a purchase transaction. Because of its ease in use, trade credit is the largest source of short-term financing for many firms both large and small.
• Answer (B) is incorrect because mortgage bonds and debentures do not arise automatically as a result of a purchase transaction.
• Answer (C) is incorrect because the use of receivables as a financing source requires an extensive factoring arrangement and often involves the creditor’s evaluation of the credit ratings of the borrower’s customers.
• Answer (D) is incorrect because mortgage bonds and debentures do not arise automatically as a result of a purchase transaction.

[731] Which one of the following is a spontaneous source of financing?

A. Notes payable.
B. Long-term debt.
C. Prepaid interest.
D. Trade credit.

• Answer (A) is incorrect because it occurs as a result of transactions apart from purchase transactions. In other words, such credit is arranged separately from the transactions to acquire the assets being financed.
• Answer (B) is incorrect because it occurs as a result of transactions apart from purchase transactions. In other words, such credit is arranged separately from the transactions to acquire the assets being financed.
• Answer (C) is incorrect because prepaid interest is not a source of financing.
• Answer (D) is correct. Trade credit is a spontaneous source of financing because it arises automatically as part of the purchase transaction.
Which one of the following statements about trade credit is correct? Trade credit is

A. Not an important source of financing for small firms.
B. A source of long-term financing to the seller.
C. Subject to risk of buyer default.
D. Usually an inexpensive source of external financing.

- Answer (A) is incorrect because Trade credit is an important source of financing for small firms.
- Answer (B) is incorrect because Trade credit is ordinarily a short-term source of financing.
- Answer (C) is correct. Trade credit is a spontaneous source of financing because it arises automatically as part of a purchase transaction. The terms of payment are set by the supplier, but trade credit usually requires payment within a short period of time. Trade credit is an important source of credit for all businesses but especially for buyers, such as small businesses, that might not have access to other credit markets. Like all forms of financing, trade credit is subject to the risk of buyer default.
- Answer (D) is incorrect because The cost of trade credit depends on the credit terms and the price paid. A seller with generous payment terms may charge a higher price for its merchandise.

Which one of the following financial instruments generally provides the largest source of short-term credit for small firms?

A. Installment loans.
B. Commercial paper.
C. Trade credit.
D. Bankers’ acceptances.

- Answer (A) is incorrect because Installment loans are usually a longer-term source of financing and are more difficult to acquire than trade credit.
- Answer (B) is incorrect because Commercial paper is normally used only by large companies with high credit ratings.
- Answer (C) is correct. Trade credit is a spontaneous source of financing because it arises automatically as part of a purchase transaction. Because of its ease in use, trade credit is the largest source of short-term financing for many firms both large and small.
- Answer (D) is incorrect because Bankers’ acceptances are drafts drawn on bank deposits; the acceptance is a guarantee of payment at maturity.

If a firm purchases materials from its supplier on a 2/10, net 40, cash discount basis, the equivalent annual interest rate (using a 360-day year) of forgoing the cash discount and making payment on the 40th day is

A. 2%
B. 18.36%
C. 24.49%
D. 36.72%

- Answer (A) is incorrect because This percentage is the discount rate.
- Answer (B) is incorrect because This percentage is based on the 40-day credit period.
Answer (C) is correct. The buyer could satisfy the $100 obligation by paying $98 on the 10th day. By choosing to wait until the 40th day, the buyer is effectively paying a $2 interest charge for the use of $98 for 30 days (40-day credit period – 10-day discount period). The annualized cost of not taking this discount can be calculated as follows:

\[
\text{Cost of not taking discount} = \left(\frac{2\%}{100\% - 2\%}\right) \times \left(\frac{360\text{ days}}{40\text{ days} - 10\text{ days}}\right)
\]

\[
= \left(\frac{2\%}{98\%}\right) \times \left(\frac{360\text{ days}}{30\text{ days}}\right)
\]

\[
= 2.0408\% \times 12
\]

\[
= 24.49\%
\]

Answer (D) is incorrect because this percentage is based on a 20-day credit period.

Richardson Supply has a $100 invoice with payment terms of 2/10, net 60. Richardson can either take the discount or place the funds in a money market account paying 6% interest. Using a 360-day year, Richardson’s cost of not taking the cash discount is

A. 12.2%  
B. 8.7%  
C. 6.4%  
D. 6.2%

Answer (A) is incorrect because the cost of not taking the cash discount is 8.7%. The company will initially lose $2 by not taking the discount. This amount is partially offset by interest earned on $98 for 50 days of $0.817. Thus, the net cost is $1.183 ($2.00 – $0.817). Because a 360-day year has 7.2 periods of 50 days each, the total annualized cost is $8.52 (7.2 × $1.183). The loss rate is about 8.7% ($8.52 ÷ $98).

Answer (B) is correct. The company will initially lose $2 by not taking the discount. This amount is partially offset by interest earned on $98 for 50 days of $0.817. Since a 360-day year has 7.2 fifty-day periods, the total annualized cost is $8.52 (7.2 × $1.183). The loss rate is about 8.7% ($8.52 ÷ $98).

Answer (C) is incorrect because the cost of not taking the cash discount is 8.7%. The company will initially lose $2 by not taking the discount. This amount is partially offset by interest earned on $98 for 50 days of $0.817. Thus, the net cost is $1.183 ($2.00 – $0.817). Because a 360-day year has 7.2 periods of 50 days each, the total annualized cost is $8.52 (7.2 × $1.183). The loss rate is about 8.7% ($8.52 ÷ $98).

Answer (D) is incorrect because the cost of not taking the cash discount is 8.7%. The company will initially lose $2 by not taking the discount. This amount is partially offset by interest earned on $98 for 50 days of $0.817. Thus, the net cost is $1.183 ($2.00 – $0.817). Because a 360-day year has 7.2 periods of 50 days each, the total annualized cost is $8.52 (7.2 × $1.183). The loss rate is about 8.7% ($8.52 ÷ $98).

If a retailer’s terms of trade are 3/10, net 45 with a particular supplier, what is the cost on an annual basis of not taking the discount? Assume a 360-day year.

A. 24.00%  
B. 37.11%  
C. 36.00%  
D. 31.81%

Answer (A) is incorrect because this percentage assumes payment of $20 to borrow $1,000 for 30 days.
Answer (B) is incorrect because this percentage assumes terms of 3/10, net 40.

Answer (C) is incorrect because this percentage assumes payment of $30 to borrow $1,000 for 30 days.

Answer (D) is correct. If the gross amount of the invoice is $1,000, the buyer will pay $970 \([1,000 \times (1.0 - .03)]\) if (s)he takes the discount. If (s)he does not, (s)he will pay $30 for the use of $970 for up to an additional 35 days. The percentage cost of not taking the discount is the annualized interest rate, that is, the $30 cost divided by the $970 effectively borrowed for 35 days, multiplied by the number of 35-day periods in a 360-day year. Thus, the cost of foregoing the discount is 31.81\% \([(30 \div 970) \times (360 \div 35)]\). The annualized cost of not taking a discount is calculated with this formula:

<table>
<thead>
<tr>
<th>Discount %</th>
<th>Days in year</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% - Discount %</td>
<td>Total payment period - Discount period</td>
</tr>
</tbody>
</table>

Cost of not taking discount = \(\frac{3\%}{100\% - 3\%} \times \frac{360\ days}{45\ days - 10\ days}\)

= \((3\% \div 97\%) \times (360\ days \div 35\ days)\)

= 3.0928\% \times 10.29

= 31.81\%

[737] Which one of the following statements concerning cash discounts is correct?

A. The cost of not taking a 2/10, net 30 cash discount is usually less than the prime rate.
B. With trade terms of 2/15, net 60, if the discount is not taken, the buyer receives 45 days of free credit.
C. The cost of not taking the discount is higher for terms of 2/10, net 60 than for 2/10, net 30.
D. The cost of not taking a cash discount is generally higher than the cost of a bank loan.

Answer (A) is incorrect because the cost of not taking a discount when terms are 2/10, net 30 exceeds 36\% annually, which is higher than the prime rate has ever been.

Answer (B) is incorrect because the buyer is paying the amount of discount not taken in exchange for the extra 45 days of credit.

Answer (C) is incorrect because paying 2\% for 20 days of credit is more expensive than paying 2\% for 50 days of the same amount of credit.

Answer (D) is correct. Payments should be made within the discount periods if the cost of not taking discounts exceeds the firm’s cost of capital. For example, failing to take a discount when terms are 2/10, net 30 means that the firm is paying an effective annual interest rate exceeding 36\%. Thus, the cost of not taking a discount is usually higher than the cost of a bank loan.

[738] When a company offers credit terms of 3/10, net 30, the annual interest cost based on a 360-day year is

A. 36.7\%
B. 24.5\%
C. 37.1\%
D. 55.6\%

Answer (A) is incorrect because this percentage assumes terms of 2/10, net 30.

Answer (B) is incorrect because this percentage assumes terms of 2/10, net 40.

Answer (C) is incorrect because this percentage assumes terms of 3/10, net 40.
Answer (D) is correct. The annualized cost of not taking a discount is calculated with this formula:

\[
\text{Cost of not taking discount} = \left( \frac{\text{Discount} \%}{100\% - \text{Discount} \%} \right) \times \left( \frac{\text{Days in year}}{\text{Total payment period} - \text{Discount period}} \right)
\]

Cost of not taking discount = \[\frac{3\%}{(100\% - 97\%)} \times \frac{360 \text{ days}}{30 \text{ days} - 10 \text{ days}}\]
= \[\frac{3\%}{97\%} \times \frac{360 \text{ days}}{20 \text{ days}}\]
= \[3.0928\% \times 18\]
= 55.67\%

Maple Motors buys axles in order to produce automobiles. Maple carries an average credit balance of $25,000,000 with its axle supplier. The axle supplier provides credit terms of 1/10 net 25. The nominal annual cost of Maple not taking the trade discount is closest to which one of the following? Assume a 360-day year.

A. 14.4\%
B. 14.5\%
C. 24.0\%
D. 24.2\%

- Answer (A) is incorrect because this percentage results from failing to take the discount period and discount percentage into account in the two denominators \[1\% \times \frac{360 \text{ days}}{25 \text{ days}} = 14.4\%\].
- Answer (B) is incorrect because this percentage results from using a 365-day year.
- Answer (C) is incorrect because this percentage results from failing to take the discount percentage into account in the denominator of the first fraction \[1\% \times \frac{360 \text{ days}}{15 \text{ days}} = 24.0\%\].
- Answer (D) is correct. The annualized cost of not taking a discount can be calculated with this formula:

\[
\text{Cost of not taking discount} = \left( \frac{\text{Discount} \%}{100\% - \text{Discount} \%} \right) \times \left( \frac{\text{Days in year}}{\text{Total payment period} - \text{Discount period}} \right)
\]

Cost of not taking discount = \[\frac{1\%}{(100\% - 1\%)} \times \frac{360 \text{ days}}{25 \text{ days} - 10 \text{ days}}\]
= \[\frac{1\%}{99\%} \times \frac{360 \text{ days}}{15 \text{ days}}\]
= \[24 \times 1.0101\%\]
= 24.24\%

Garo Company, a retail store, is considering forgoing sales discounts to delay using its cash. Supplier credit terms are 2/10, net 30. Assuming a 360-day year, what is the annual cost of credit if the cash discount is not taken and Garo pays net 30?

A. 24.0\%
B. 24.5\%
C. 36.0\%
D. 36.7\%

- Answer (A) is incorrect because this percentage results from failing to subtract the discount percentage in the denominator of the percentage fraction and from using the entire payment period in the denominator of the days fraction.
- Answer (B) is incorrect because the length of the extra credit period is 20 days, not 30 days.
Answer (C) is incorrect because this percentage results from failing to subtract the discount percentage in the denominator of the percentage fraction.

Answer (D) is correct. The annualized cost of not taking a discount is calculated using this formula:

\[
\text{Cost of not taking discount} = \frac{2\%}{100\% - 2\%} \times \frac{360 \text{ days}}{30 \text{ days} - 10 \text{ days}}
\]

\[
= \frac{2\%}{98\%} \times 18
\]

\[
= 36.73\%
\]

[741] When a company offers credit terms of 2/10, net 30, the annual interest cost, based on a 360-day year, is

A. 24.0%
B. 35.3%
C. 36.0%
D. 36.7%

Answer (A) is incorrect because this percentage results from failing to subtract the discount percentage in the denominator of the percentage fraction and from using the entire payment period in the denominator of the days fraction.

Answer (B) is incorrect because this percentage results from adding, rather than subtracting, the discount percentage in the denominator of the percentage fraction.

Answer (C) is incorrect because this percentage results from failing to subtract the discount percentage in the denominator of the percentage fraction.

Answer (D) is correct. The annualized cost of not taking a discount is calculated using this formula:

\[
\text{Cost of not taking discount} = \frac{2\%}{100\% - 2\%} \times \frac{360 \text{ days}}{30 \text{ days} - 10 \text{ days}}
\]

\[
= \frac{2\%}{98\%} \times 18
\]

\[
= 36.73\%
\]

[742] The high cost of short-term financing has recently caused a company to reevaluate the terms of credit it extends to its customers. The current policy is 1/10, net 60. Customers can borrow at the prime rate. Which of the following prime rates would induce the company to change its terms of credit in order to avoid an undesirable extension in its collection of receivables?

A. 2%
B. 5%
C. 7%
D. 8%
Answer (A) is incorrect because the prime rate must be greater than 7.37% to make the company's terms preferable to those of a bank.

Answer (B) is incorrect because the prime rate must be greater than 7.37% to make the company's terms preferable to those of a bank.

Answer (C) is incorrect because the prime rate must be greater than 7.37% to make the company's terms preferable to those of a bank.

Answer (D) is correct. Terms of 1/10, net 60 mean that a buyer can save 1% of the purchase price by paying 50 days early. In essence, not taking the discount results in the buyer's borrowing 99% of the invoice price for 50 days at a total interest charge of 1% of the invoice price. Because a year has 7.350-day periods (365 ÷ 50), the credit terms 1/10, net 60 yield an effective annualized interest charge of approximately 7.37% [(1% ÷ 99%) × 7.3]. If the prime rate were higher than 7.37%, the buyer would prefer to borrow from the vendor (i.e., not pay within the discount period) rather than from a bank. Consequently, an 8% prime rate could cause the vendor's receivables to increase.

[743] If a firm's credit terms require payment within 45 days but allow a discount of 2% if paid within 15 days (using a 360-day year), the approximate cost or benefit of the trade credit terms is

A. 2%
B. 16%
C. 48%
D. 24%

Answer (A) is incorrect because the 2% savings is for 30 days only; the annualized interest rate paid for receiving the money early must be calculated.

Answer (B) is incorrect because this percentage results from using the entire payment period in the denominator of the days fraction.

Answer (C) is incorrect because this percentage results from using the discount period in the denominator of the days fraction and from failing to subtract the discount percentage in the denominator of the percentage fraction.

Answer (D) is correct. The annualized effective rate on credit terms is derived using this formula:

\[
\text{Effective rate} = \left( \frac{\text{Discount} \times \text{Total payment period}}{100} \right) \times \frac{\text{Days in year}}{\text{Total payment period} - \text{Discount period}}
\]

The effective rate on terms of 2/15, net 45 can thus be calculated as follows:

\[
\text{Effective rate} = \left( \frac{2\% \times (360 \text{ days} - 15 \text{ days})}{100 - 2\%} \right) \times \frac{360 \text{ days}}{30 \text{ days}} = 2.0408\% \times 12 = 24.49\%
\]

[744] Which one of the following responses is not an advantage to a corporation that uses the commercial paper market for short-term financing?

A. This market provides more funds at lower rates than other methods provide.
B. The borrower avoids the expense of maintaining a compensating balance with a commercial bank.
C. There are no restrictions as to the type of corporation that can enter into this market.
D. This market provides a broad distribution for borrowing.
Answer (A) is incorrect because Lower rates are an advantage of commercial paper.

Answer (B) is incorrect because Avoidance of compensating balance requirements is an advantage of commercial paper.

Answer (C) is correct. Commercial paper is a short-term, unsecured note payable issued in large denominations by major companies with excellent credit ratings. Maturities usually do not exceed 270 days. Commercial paper is a lower cost source of funds than bank loans, and no compensating balances are required. Commercial paper provides a broad and efficient distribution of debt, and costly financing arrangements are avoided. But the market is not open to all companies because only major corporations with high credit ratings can participate.

Answer (D) is incorrect because Broad debt distribution is an advantage of commercial paper.

[Fact Pattern #73]

CyberAge Outlet, a relatively new store, is a cafe that offers customers the opportunity to browse the Internet or play computer games at their tables while they drink coffee. The customer pays a fee based on the amount of time spent signed on to the computer. The store also sells books, tee-shirts, and computer accessories. CyberAge has been paying all of its bills on the last day of the payment period, thus forfeiting all supplier discounts. Shown below are data on CyberAge’s two major vendors, including average monthly purchases and credit terms.

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Average Monthly Purchases</th>
<th>Credit Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Master</td>
<td>$25,000</td>
<td>2/10, net 30</td>
</tr>
<tr>
<td>Softidee</td>
<td>50,000</td>
<td>5/10, net 90</td>
</tr>
</tbody>
</table>

[745] (Refers to Fact Pattern #73)

Assuming a 360-day year and that CyberAge continues paying on the last day of the credit period, the company’s weighted-average annual interest rate for trade credit (ignoring the effects of compounding) for these two vendors is

A. 27.0%
B. 25.2%
C. 28.0%
D. 30.2%

Answer (A) is incorrect because This percentage is based on weights of $25,000 and $50,000.
Answer (B) is correct. The annualized costs of not taking the discounts offered by these two vendors can be calculated as follows:

\[
\text{Cost of not taking discount} = \left(\frac{\text{Discount \%}}{100\% - \text{Discount \%}}\right) \times \left(\frac{\text{Total payment period} - \text{Discount period}}{\text{Days in year}}\right)
\]

**Web Master:**

\[
\begin{align*}
\text{Cost of not taking discount} &= \left[\frac{2\%}{100\% - 2\%}\right] \times \left[\frac{360 \text{ days}}{30 \text{ days} - 10 \text{ days}}\right] \\
&= \left[\frac{2\%}{98\%}\right] \times \left[\frac{360 \text{ days}}{20 \text{ days}}\right] \\
&= 2.0408\% \times 18 \\
&= 36.73\%
\end{align*}
\]

**Softidee:**

\[
\begin{align*}
\text{Cost of not taking discount} &= \left[\frac{5\%}{100\% - 5\%}\right] \times \left[\frac{360 \text{ days}}{90 \text{ days} - 10 \text{ days}}\right] \\
&= \left[\frac{5\%}{95\%}\right] \times \left[\frac{360 \text{ days}}{80 \text{ days}}\right] \\
&= 5.2632\% \times 4.5 \\
&= 23.68\%
\end{align*}
\]

The average amount borrowed from Web Master is $16,333.33 \left(\frac{24,500 \times 1 \text{ month}}{30 \text{ days}}\right)$, and the average amount borrowed from Softidee is $126,666.67 \left(\frac{47,500 \times 3 \text{ months}}{90 \text{ days}}\right)$. Thus, the weighted average of these two rates based on average borrowings is $25.2\% \left(\frac{16,333.33 \times 36.73\% + 126,666.67 \times 23.68\%}{16,333.33 + 126,666.67}\right)$. This calculation, however, underestimates the true cost of not taking the discount because it does not consider the effects of compounding.

- Answer (C) is incorrect because this percentage is based on weights of $24,500 and $47,500.
- Answer (D) is incorrect because this percentage is an unweighted average of the two interest rates.

[746] (Refers to Fact Pattern #73)

Should CyberAge use trade credit and continue paying at the end of the credit period?

A. Yes, if the cost of alternative short-term financing is less.
B. Yes, if the firm’s weighted-average cost of capital is equal to its weighted-average cost of trade credit.
C. No, if the cost of alternative long-term financing is greater.
D. Yes, if the cost of alternative short-term financing is greater.

- Answer (A) is incorrect because The company should continue the current practice unless alternative short-term financing is available at a lower rate.
- Answer (B) is incorrect because The weighted-average cost of capital is usually a concern in capital budgeting and is not as important in the decision process as the marginal cost of capital. Furthermore, trade credit is just one element in the firm’s financing structure. An optimal mix of financing sources may require that trade credit be obtained at less than the weighted-average cost of capital.
- Answer (C) is incorrect because The company should maintain its current practice if the cost of alternative long-term financing is higher.
- Answer (D) is correct. The company is currently paying an annual rate of 25.2\% (see previous question) to obtain trade credit and pay at the end of the credit period. This policy should be continued if trade credit is the only source of financing, or if other sources are available only at a higher rate.
Commercial paper

A. Has a maturity date greater than 1 year.
B. Is usually sold only through investment banking dealers.
C. Ordinarily does not have an active secondary market.
D. Has an interest rate lower than Treasury bills.

- Answer (A) is incorrect because Commercial paper usually has a maturity date of 270 days or less to avoid securities registration requirements.
- Answer (B) is incorrect because Commercial paper is often issued directly by the borrowing firm.
- Answer (C) is correct. Commercial paper is an unsecured note that is sold by only the most creditworthy firms. It is issued at a discount from its face amount and has a term of 270 days or less. Commercial paper usually has a lower interest rate than other means of financing. No general (active) secondary market exists for commercial paper, but most dealers will repurchase an issue that they have sold.
- Answer (D) is incorrect because Interest rates must be higher than those of Treasury bills to entice investors. Commercial paper is more risky than Treasury bills.

The following forms of short-term borrowing are available to a firm:

- Floating lien
- Factoring
- Revolving credit
- Chattel mortgages
- Bankers’ acceptances
- Lines of credit
- Commercial paper

The forms of short-term borrowing that are unsecured credit are

A. Floating lien, revolving credit, chattel mortgage, and commercial paper.
B. Factoring, chattel mortgage, bankers’ acceptances, and line of credit.
C. Floating lien, chattel mortgage, bankers’ acceptances, and line of credit.
D. Revolving credit, bankers’ acceptances, line of credit, and commercial paper.

- Answer (A) is incorrect because A chattel mortgage is a loan secured by personal property (movable property such as equipment or livestock). Also, a floating lien is secured by property, such as inventory, the composition of which may be constantly changing.
- Answer (B) is incorrect because A chattel mortgage is a loan secured by personal property (movable property such as equipment or livestock). Also, factoring is a form of financing in which receivables serve as security.
- Answer (C) is incorrect because A chattel mortgage is a loan secured by personal property (movable property such as equipment or livestock). Also, a floating lien is secured by property, such as inventory, the composition of which may be constantly changing.
- Answer (D) is correct. An unsecured loan is a loan made by a bank based on credit information about the borrower and the ability of the borrower to repay the obligation. The loan is not secured by collateral but is made on the signature of the borrower. Revolving credit, bankers’ acceptances, lines of credit, and commercial paper are all unsecured means of borrowing.
Short-term, unsecured promissory notes issued by large firms are known as

A. Agency securities.
B. Bankers’ acceptances.
C. Commercial paper.
D. Repurchase agreements.

- Answer (A) is incorrect because an agency security is issued by a corporation or agency created by the U.S. government. Examples are government securities issued by the bodies that finance mortgages, such as the Federal National Mortgage Association (Fannie Mae).
- Answer (B) is incorrect because Bankers’ acceptances are drafts drawn on deposits at a bank. The acceptance by the bank guarantees payment at maturity. They are normally used to finance a specific transaction.
- Answer (C) is correct. Commercial paper is the term for the short-term (typically less than 9 months), unsecured, large denomination (often over $100,000) promissory notes issued by large, credit-worthy companies to other companies and institutional investors. In many instances, the maturity date is only a few days after issuance.
- Answer (D) is incorrect because a repurchase agreement involves a secured loan to a government securities dealer. It allows the buyer to retain interest income although the seller-dealer can repurchase after a specified time.

With respect to the use of commercial paper by an industrial firm, which one of the following statements is most likely to be true?

A. The commercial paper is issued through a bank.
B. The commercial paper has a maturity of 60-270 days.
C. The commercial paper is secured by the issuer’s assets.
D. The commercial paper issuer is a small company.

- Answer (A) is incorrect because large corporations with high credit ratings, not banks, issue commercial paper.
- Answer (B) is correct. Most commercial paper has a maturity of between 60 and 270 days.
- Answer (C) is incorrect because Commercial paper consists of unsecured notes payable issued in large denominations ($100,000 or more).
- Answer (D) is incorrect because commercial paper is issued by large companies with high credit ratings to other companies and institutional investors.

Corbin, Inc., can issue 3-month commercial paper with a face value of $1,000,000 for $980,000. Transaction costs will be $1,200. The effective annualized percentage cost of the financing, based on a 360-day year, will be

A. 8.16%
B. 8.66%
C. 8.00%
D. 2.00%

- Answer (A) is incorrect because this percentage is calculated without including transaction costs.
- Answer (B) is correct. The total cost to the company will be $21,200 ($20,000 discount + $1,200 transaction cost), and the net amount available will be $978,800. The annualized amount of the costs is $84,800 (4 × $21,200). Accordingly, the annual interest cost will be 8.66% ($84,800 ÷ $978,800).
- Answer (C) is incorrect because this percentage is calculated without including transaction costs as part of the total costs to the firm. It also assumes that the full $1,000,000 is available for use to the firm.
Answer (D) is incorrect because this percentage is calculated by dividing the discount for 3 months by the face value.

[752] Randy, Inc., can issue 3-month commercial paper with a face value of $1,500,000 for $1,450,000. Transaction costs will be $1,500. The effective annualized percentage cost of the financing, based on a 360-day year, will be

A. 3.45%
B. 3.56%
C. 14.22%
D. 13.79%

Answer (A) is incorrect because this percentage ignores the transaction costs and fails to annualize the percentage.

Answer (B) is incorrect because this percentage fails to annualize the result.

Answer (C) is correct. The total cost to the company will be $51,500 ($50,000 discount + $1,500 of transaction costs), and the net amount available will be $1,448,500. The annualized amount of the costs is $206,000 ($51,500 × 4). Accordingly, the annual interest cost will be 14.22% ($206,000 ÷ $1,448,500).

Answer (D) is incorrect because this percentage ignores the transaction costs.

[Fact Pattern #74]
Morton Company needs to pay a supplier’s invoice of $50,000 and wants to take a cash discount of 2/10, net 40. The firm can borrow the money for 30 days at 12% per annum plus a 10% compensating balance.

The amount Morton Company must borrow to pay the supplier within the discount period and cover the compensating balance is

A. $55,000
B. $55,056
C. $55,556
D. $54,444

Answer (A) is incorrect because the amount of $55,000 is 110% of the invoice.

Answer (B) is incorrect because this figure is a nonsense number.

Answer (C) is incorrect because the amount of $55,556 assumes no cash discount.

Answer (D) is correct. Morton’s total borrowings can be calculated as follows:

Total borrowings: = Amount needed ÷ (1.0 − Compensating balance %)
= ($50,000 × 98%) ÷ (100% − 10%)
= $49,000 ÷ 90%
= $54,444
Assuming Morton Company borrows the money on the last day of the discount period and repays it 30 days later, the effective interest rate on the loan is

A. 12.00%
B. 13.33%
C. 13.20%
D. 13.48%

- Answer (A) is incorrect because this percentage is the contract rate.
- Answer (B) is correct. Morton’s effective rate on this loan can be calculated as follows:

  Effective rate = Stated rate ÷ (1.0 – Compensating balance %)
  = 12% ÷ (100% – 10%)
  = 12% ÷ 90%
  = 13.33%

- Answer (C) is incorrect because this percentage assumes that the company has access to loan funds of $50,000 and is calculated by determining interest based on a loan total of $55,000.
- Answer (D) is incorrect because this percentage is calculated by determining interest on a loan amount of $55,056.

Skilantic Company needs to pay a supplier’s invoice of $60,000 and wants to take a cash discount of 2/10, net 40. The firm can borrow the money for 30 days at 11% per annum plus a 9% compensating balance.

The amount Skilantic must borrow to pay the supplier within the discount period and cover the compensating balance is

A. $60,000
B. $65,934
C. $64,615
D. $58,800

- Answer (A) is incorrect because the amount of $60,000 is the invoice amount.
- Answer (B) is incorrect because the amount of $65,934 assumes the amount paid to the supplier is $60,000.
- Answer (C) is correct. Skilantic’s total borrowings on this loan can be calculated as follows:

  Total borrowings = Amount needed ÷ (1.0 – Compensating balance %)
  = ($60,000 × 98%) ÷ (100% – 9%)
  = $58,800 ÷ 91%
  = $64,615

- Answer (D) is incorrect because the amount of $58,800 is the amount to be paid to the supplier.
Assuming Skilantic borrows the money on the last day of the discount period and repays it 30 days later, the effective interest rate on the loan is

A. 11%
B. 10%
C. 12.09%
D. 9.90%

- Answer (A) is incorrect because this percentage is the contract rate.
- Answer (B) is incorrect because the effective rate is greater than the contract rate. The usable funds are less than the face amount of the note.
- Answer (C) is correct. Skilantic’s effective rate on this loan can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{(1.0 - \text{Compensating balance \%})} = \frac{11\%}{91\%} = 12.09\%
\]

- Answer (D) is incorrect because the effective rate is greater than the contract rate. The usable funds are less than the face amount of the note.

If Skilantic fails to take the discount and pays on the 40th day, what effective rate of annual interest is it paying the vendor?

A. 2%
B. 24%
C. 24.49%
D. 36.73%

- Answer (A) is incorrect because the discount rate for a 30-day period is 2%.
- Answer (B) is incorrect because this percentage assumes that the available funds equal $60,000.
- Answer (C) is correct. By failing to take the discount, Skilantic is essentially borrowing $58,800 for 30 days. Thus, at a cost of $1,200, the company acquires the use of $58,800, resulting in a rate of \(\frac{2.0408\%}{30 \text{ days}}\) for 30 days. Assuming a 360-day year, the effective annual rate is 24.49\% \([2.0408\% \times (360 \text{ days} + 30 \text{ days})]\).
- Answer (D) is incorrect because this percentage assumes a 20-day discount period.

A company has just borrowed $2 million from a bank. The stated rate of interest is 10%. If the loan is discounted and is repayable in 1 year, the effective rate on the loan is approximately

A. 8.89%
B. 9.09%
C. 10.00%
D. 11.11%
Answer (A) is incorrect because the prepayment of interest reduces the funds available, resulting in an effective interest rate greater than the contract rate.

Answer (B) is incorrect because the prepayment of interest reduces the funds available, resulting in an effective interest rate greater than the contract rate.

Answer (C) is incorrect because this percentage is the contract rate. The effective rate is higher because the full $2 million face amount of the note will not be available to the borrower.

Answer (D) is correct. The effective interest rate on a discounted loan can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{1 - \text{Stated rate}}
\]

\[
= \frac{10\%}{1 - 0.10}
\]

\[
= 11.11\%
\]

Note that the amount of the loan is not needed to calculate the effective rate.

[759] On January 1, Scott Corporation received a $300,000 line of credit at an interest rate of 12% from Main Street Bank and drew down the entire amount on February 1. The line of credit agreement requires that an amount equal to 15% of the loan be deposited into a compensating balance account. What is the effective annual cost of credit for this loan arrangement?

A. 11.00%
B. 12.00%
C. 12.94%
D. 14.12%

Answer (A) is incorrect because the nominal rate for 11 months is 11.00%.

Answer (B) is incorrect because the nominal rate of interest is 12.00%.

Answer (C) is incorrect because this percentage equals $33,000 (11 months of interest) divided by $255,000.

Answer (D) is correct. The effective interest rate on this financing arrangement can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{1 - \text{Compensating balance \%}}
\]

\[
= \frac{12\%}{1 - 0.15}
\]

\[
= 12\% / 85\%
\]

\[
= 14.12\%
\]

The amount of the loan is not needed to calculate the effective rate.

[760] Hagar Company’s bank requires a compensating balance of 20% on a $100,000 loan. If the stated interest on the loan is 7%, what is the effective cost of the loan?

A. 5.83%
B. 7.00%
C. 8.40%
D. 8.75%

Answer (A) is incorrect because the borrower has access to less, not more, than the face amount of the loan.
Answer (B) is incorrect because the effective rate is higher than the contract rate as a result of the compensating balance requirement.

Answer (C) is incorrect because this percentage is 120% of the contract rate.

Answer (D) is correct. The effective interest rate on a loan with a compensating balance can be calculated as follows:

\[
\text{Effective rate} = \text{Stated rate} \div (1.0 - \text{Compensating balance } \%) \\
= 7\% \div (100\% - 20\%) \\
= 7\% \div 80\% \\
= 8.75\%
\]

Note that the amount of the loan is not needed to calculate the effective rate.

A company obtained a short-term bank loan of $250,000 at an annual interest rate of 6%. As a condition of the loan, the company is required to maintain a compensating balance of $50,000 in its checking account. The checking account earns interest at an annual rate of 2%. Ordinarily, the company maintains a balance of $25,000 in its account for transaction purposes. What is the effective interest rate of the loan?

A. 6.44%  
B. 7.00%  
C. 5.80%  
D. 6.66%

- Answer (A) is correct. The $50,000 compensating balance requirement is partially satisfied by the company’s practice of maintaining a $25,000 balance for transaction purposes. Thus, only $25,000 of the loan will not be available for current use, leaving $225,000 of the loan usable. At 6% interest, the $250,000 loan would require an interest payment of $15,000 per year. This is partially offset by the 2% interest earned on the $25,000 incremental balance, or $500. Subtracting the $500 interest earned from the $15,000 of expense results in net interest expense of $14,500 for the use of $225,000 in funds. Dividing $14,500 by $225,000 produces an effective interest rate of 6.44%.
- Answer (B) is incorrect because this percentage fails to consider that the $25,000 currently being maintained counts toward the compensating balance requirement.
- Answer (C) is incorrect because this percentage fails to consider the compensating balance requirement.
- Answer (D) is incorrect because this percentage fails to consider the interest earned on the incremental balance being carried.

A company obtained a short-term bank loan of $500,000 at an annual interest rate of 8%. As a condition of the loan, the company is required to maintain a compensating balance of $100,000 in its checking account. The checking account earns interest at an annual rate of 3%. Ordinarily, the company maintains a balance of $50,000 in its account for transaction purposes. What is the effective interest rate of the loan?

A. 7.77%  
B. 8.22%  
C. 9.25%  
D. 8.56%

- Answer (A) is incorrect because the effective interest rate must exceed the 8% contract rate because not all of the borrowed funds are available for the debtor’s use.
- Answer (B) is incorrect because this percentage assumes incremental earnings on the checking account of $3,000.
- Answer (C) is incorrect because this percentage is based on the assumption that the company ordinarily maintains a zero balance.
Answer (D) is correct. The $100,000 compensating balance requirement is partially satisfied by the company’s practice of maintaining a $50,000 balance for transaction purposes. Thus, only $50,000 of the loan will not be available for current use, leaving $450,000 of the loan usable. At 8% interest, the $500,000 loan would require an interest payment of $40,000 per year. This is partially offset by the 3% interest earned on the $50,000 incremental balance, or $1,500. Subtracting the $1,500 interest earned from the $40,000 of expense results in net interest expense of $38,500 for the use of $450,000 in funds. Dividing $38,500 by $450,000 produces an effective interest rate of 8.56%.

A manufacturing firm wants to obtain a short-term loan and has approached several lending institutions. All of the potential lenders are offering the same nominal interest rate but the terms of the loans vary. Which of the following combinations of loan terms will be most attractive for the borrowing firm?

A. Simple interest, no compensating balance.
B. Discount interest, no compensating balance.
C. Simple interest, 20% compensating balance required.
D. Discount interest, 20% compensating balance required.

Answer (A) is correct. The most desirable set of terms are those that result in the lowest cost of borrowing. Discount interest results in a higher effective borrowing cost than simple interest because the bank deducts interest in advance so the borrower receives less than the face value of the loan. A compensating balance results in a higher effective borrowing cost because the compensating balance is an amount of cash that the firm is unable to use. The cheapest terms, given that all options have the same nominal interest rate, will be simple interest with no compensating balance.

Answer (B) is incorrect because Discount interest results in a higher effective borrowing cost than simple interest because the bank deducts interest in advance so the borrower receives less than the face value of the loan.

Answer (C) is incorrect because A compensating balance results in a higher effective borrowing cost because the compensating balance is an amount of cash that the firm is unable to use.

Answer (D) is incorrect because Discount interest and a compensating balance are disadvantageous to the borrower.

The prime lending rate of commercial banks is an announced rate and is often understated from the viewpoint of even the most credit-worthy firms. Which one of the following requirements always results in a higher effective interest rate?

A. A floating rate for the loan period.
B. A covenant that restricts the issuance of any new unsecured bonds during the existence of the loan.
C. The imposition of a compensating balance with an absolute minimum that cannot be met by current transaction balances.
D. The absence of a charge for any unused portion in the line of credit.

Answer (A) is incorrect because The floating interest rate is not always higher. It should float up or down with the prime rate.

Answer (B) is incorrect because A restriction on a new issuance does not raise the interest rate on money previously borrowed.

Answer (C) is correct. When a firm borrows money from the bank, it is often required to keep a certain percentage of the funds in the bank at all times. These compensating balances effectively increase the rate of interest on the money borrowed from the bank.

Answer (D) is incorrect because If a firm chooses not to use its full line of credit and is not charged for the unused portion, the rate of interest on the portion used does not increase.
The prime rate is the rate charged on business loans to borrowers with high credit ratings. 

- Answer (A) is incorrect because The prime rate has nothing to do with a commitment fee on a bank loan.
- Answer (B) is incorrect because The effective rate on most companies' bank loans will be much higher than the prime rate.
- Answer (C) is incorrect because The prime rate is a bank loan rate, not the rate on commercial paper.
- Answer (D) is correct. The prime interest rate is the rate charged by commercial banks to their best (the largest and financially strongest) business customers. It is traditionally the lowest rate charged by banks. However, in recent years, banks have been making loans at still lower rates in response to competition from the commercial paper market.

A small retail business would most likely finance its merchandise inventory with

- Answer (A) is incorrect because Only large companies with excellent credit ratings have access to the commercial paper market.
- Answer (B) is incorrect because A retail store must have instant access to its inventory to provide continuous services to customers. Thus, a loan on a terminal warehouse receipt loan would not be suitable because the inventory would not be in the immediate possession of the seller.
- Answer (C) is correct. A small retail store would not have access to major capital markets. In fact, the only options available, outside of owner financing, are bank loans and a line of credit from suppliers. It is this latter alternative that is most often used because it permits the store to finance inventories for 30 to 60 days without incurring interest cost. A line of credit is an arrangement between a bank and a borrower in which the bank commits itself to lend up to a certain maximum amount to the borrower in a given period.
- Answer (D) is incorrect because A chattel mortgage is most often used for financing moveable equipment. It is not well-suited to financing inventory of a small retailer with high turnover because of the difficulty of identification.

If a firm borrows $500,000 at 10% and is required to maintain $50,000 as a minimum compensating balance at the bank, what is the effective interest rate on the loan?

- Answer (A) is incorrect because This percentage is the nominal rate.
- Answer (B) is correct. At 10%, the interest on a $500,000 loan is $50,000 per year. However, the $500,000 loan is effectively reduced to $450,000 of usable funds by the compensating balance requirement. Thus, the borrower pays $50,000 of interest for a $450,000 loan, an effective rate of 11.1% ($50,000 ÷ $450,000).
- Answer (C) is incorrect because This percentage equals $50,000 divided by $550,000.
The Dixon Corporation has an outstanding 1-year bank loan of $300,000 at a stated interest rate of 8%. In addition, Dixon is required to maintain a 20% compensating balance in its checking account. Assuming the company would normally maintain a zero balance in its checking account, the effective interest rate on the loan is

A. 6.4%
B. 8.0%
C. 20%
D. 10.0%

- Answer (A) is incorrect because Having only 80% of the borrowed funds available means the effective rate will be greater than the 8% contract rate.
- Answer (B) is incorrect because The nominal rate is 8%.
- Answer (C) is incorrect because The percentage of the required compensating balance is 20%.
- Answer (D) is correct. The requirement to maintain a compensating balance of 20% of the $300,000 loan means that the borrower has effective use of only 80% of the loan, or $240,000. The 8% interest rate applied to a $300,000 loan requires an annual interest expenditure of $24,000. In turn, paying $24,000 for the use of $240,000 indicates an effective interest rate of 10%.

Elan Corporation is considering borrowing $100,000 from a bank for 1 year at a stated interest rate of 9%. What is the effective interest rate to Elan if this borrowing is in the form of a discounted note?

A. 8.10%
B. 9.00%
C. 9.81%
D. 9.89%

- Answer (A) is incorrect because The lesser amount of funds available on a discounted note means the effective rate will be higher than the contract rate.
- Answer (B) is incorrect because The nominal rate (discount rate) is 9.00%.
- Answer (C) is incorrect because The nominal rate multiplied by 9% equals 9.81%.
- Answer (D) is correct. The effective interest rate on a discounted loan can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{1 - \text{Stated rate}}
\]

\[
= \frac{9\%}{100\% - 9\%}
\]

\[
= \frac{9\%}{91\%}
\]

\[
= 9.89\%
\]

Note that the amount of the loan is not needed to calculate the effective rate.
The Altmane Corporation was recently quoted terms on a commercial bank loan of 7% discounted interest with a 20% compensating balance. The term of the loan is 1 year. The effective cost of borrowing is (rounded to the nearest hundredth)

A. 8.75%
B. 9.41%
C. 7.53%
D. 9.59%

- Answer (A) is incorrect because this percentage equals $70 divided by $800.
- Answer (B) is incorrect because this percentage equals $70 divided by $744.
- Answer (C) is incorrect because this percentage equals $70 divided by $930.
- Answer (D) is correct. To illustrate, assume a $1,000 loan; the interest at 7% for 1 year is $70. Hence, the proceeds of the loan are $930 ($1,000 – $70). Also, 20% of the note, or $200, cannot be used by the borrower because of the compensating balance requirement. Consequently, only $730 is available for use by the borrower. Paying $70 interest for the use of $730 gives an interest rate of 9.59% ($70 ÷ $730).

The effective interest rate on a discounted loan with a compensating balance requirement can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{(1.0 - \text{Stated rate} - \text{Compensating balance} \%)}
\]
\[
= \frac{7\%}{(100\% - 7\% - 20\%)}
\]
\[
= \frac{7\%}{73\%}
\]
\[
= 9.59\%
\]

The Flesher Corporation was recently quoted terms on a commercial bank loan of 6% discounted interest with a 22% compensating balance. The term of the loan is 1 year. The effective cost of borrowing is (rounded to the nearest hundredth)

A. 6.00%
B. 6.38%
C. 7.69%
D. 8.33%

- Answer (A) is incorrect because the contract rate is 6%.
- Answer (B) is incorrect because this percentage does not consider the compensating balance requirement.
- Answer (C) is incorrect because this percentage assumes the interest is not paid in advance.
- Answer (D) is correct. The effective interest rate on a discounted loan with a compensating balance requirement can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{(1.0 - \text{Stated rate} - \text{Compensating balance} \%)}
\]
\[
= \frac{6\%}{(100\% - 6\% - 22\%)}
\]
\[
= \frac{6\%}{72\%}
\]
\[
= 8.33\%
\]
The Red Company has a revolving line of credit of $300,000 with a 1-year maturity. The terms call for a 6% interest rate and a 1/2% commitment fee on the unused portion of the line of credit. The average loan balance during the year was $100,000. The annual cost of this financing arrangement is

A. $6,000
B. $6,500
C. $7,000
D. $7,500

- Answer (A) is incorrect because the amount of $6,000 results from improperly excluding the 1/2% commitment fee.
- Answer (B) is incorrect because the amount of $6,500 results from improperly applying the 1/2% commitment fee to the used portion of the line of credit, rather than the unused portion.
- Answer (C) is correct. The annual cost of Red’s financing arrangement can be calculated as follows:

\[
\text{Annual cost} = \text{Interest expense on average balance} + \text{Commitment fee on unused portion} = (\text{Average balance} \times \text{Stated rate}) + [(\text{Credit limit} – \text{Average balance}) \times \text{Commitment fee %}] \\
= ($100,000 \times 6\%) + [($300,000 – $100,000) \times 0.5\%] \\
= $6,000 + $1,000 \\
= $7,000
\]

- Answer (D) is incorrect because the amount of $7,500 results from improperly applying the 1/2% commitment fee to the total line of credit rather than only the unused portion.

The treasury analyst for Garth Manufacturing has estimated the cash flows for the first half of next year (ignoring any short-term borrowings) as follows:

<table>
<thead>
<tr>
<th></th>
<th>Inflows</th>
<th>Outflows</th>
</tr>
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<td>$1</td>
</tr>
<tr>
<td>February</td>
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<td>4</td>
</tr>
<tr>
<td>March</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>April</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>May</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>June</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Garth has a line of credit of up to $4 million on which it pays interest monthly at a rate of 1% of the amount utilized. Garth is expected to have a cash balance of $2 million on January 1 and no amount utilized on its line of credit. Assuming all cash flows occur at the end of the month, approximately how much will Garth pay in interest during the first half of the year?

A. $0
B. $61,000
C. $80,000
D. $132,000

- Answer (A) is incorrect because interest must be paid monthly when the credit line is used in April, May, and June.
Answer (B) is correct. The sum of the beginning balance and inflows exceeds the outflows for the first 2 months. At the end of March, however, Garth must use $2,000,000 of its line of credit ($2,000,000 beginning balance + $6,000,000 inflows – $10,000,000 outflows). Thus, interest for April is $20,000 ($2,000,000 × 1%). The net cash outflow for April (ignoring short-term borrowings) is $1,000,000 of an additional $1,000,000 of the line of credit. However, the $20,000 of interest for April must also be paid, so the amount of the line of credit used in May is $3,020,000 ($2,000,000 + $1,000,000 + $20,000). Interest for May is therefore $30,200 ($3,020,000 × 1%). Given the net cash inflow for May of $2,000,000 (again ignoring short-term borrowings) and the borrowing of $30,200 to pay the interest for May, the amount of the line of credit used in June is $1,050,200. Interest in June is $10,502 ($1,050,200 × 1%), and total interest is $60,702 ($20,000 + $30,200 + $10,502). Consequently, the closest answer is $61,000.

Answer (C) is incorrect because The company would repay the credit line at the end of months with a positive cash flow.

Answer (D) is incorrect because The company would repay the credit line at the end of months with a positive cash flow.

An example of secured short-term financing is

- Commercial paper.
- A warehouse receipt.
- A revolving credit agreement.
- Line of credit.

Answer (A) is incorrect because Commercial paper is a type of unsecured, short-term promissory note issued by large firms to other firms, insurance companies, mutual funds, etc.

Answer (B) is correct. A warehouse receipt is issued by a person engaged in the business of storing goods for hire. Security for short-term inventory financing can be arranged if the debtor places its inventory under the control of the lender or its agent (e.g., a public warehouse), and the lender holds the warehouse receipts.

Answer (C) is incorrect because A revolving credit agreement is a formal line of credit, usually with a bank, that large firms often use.

Answer (D) is incorrect because A line of credit is an arrangement, which may be formal or informal, between a commercial bank and its customer concerning the maximum loan amount available.

A firm that often factors its accounts receivable has an agreement with its finance company that requires the firm to maintain a 6% reserve and charges 1% commission on the amount of receivables. The net proceeds would be further reduced by an annual interest charge of 10% on the monies advanced. Assuming a 360-day year, what amount of cash (rounded to the nearest dollar) will the firm receive from the finance company at the time a $100,000 account that is due in 90 days is turned over to the finance company?

- $93,000
- $90,000
- $90,675
- $83,700

Answer (A) is incorrect because The amount of $93,000 results from failing to consider the interest expense.

Answer (B) is incorrect because The amount of $90,000 results from considering only 10% interest for a full year.
Answer (C) is correct. The first step is to calculate the gross proceeds the firm will receive from the factoring transaction:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of receivable</td>
<td>$100,000</td>
</tr>
<tr>
<td>Less: reserve ($100,000 × 6%)</td>
<td>(6,000)</td>
</tr>
<tr>
<td>Less: factor fee ($100,000 × 1%)</td>
<td>(1,000)</td>
</tr>
<tr>
<td><strong>Gross proceeds</strong></td>
<td><strong>$93,000</strong></td>
</tr>
</tbody>
</table>

This amount must be reduced by the interest charged on the gross proceeds:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross proceeds</td>
<td>$93,000</td>
</tr>
<tr>
<td>Times: annual finance charge × 10%</td>
<td></td>
</tr>
<tr>
<td>Annualized interest expense</td>
<td>$9,300</td>
</tr>
<tr>
<td>Times: portion of year (90 days ÷ 360 days) × 25%</td>
<td></td>
</tr>
<tr>
<td>Interest expense</td>
<td>$2,325</td>
</tr>
</tbody>
</table>

The actual cash the firm will receive from this factoring transaction is thus calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross proceeds</td>
<td>$93,000</td>
</tr>
<tr>
<td>Less: interest expense</td>
<td>(2,325)</td>
</tr>
<tr>
<td><strong>Net proceeds</strong></td>
<td><strong>$90,675</strong></td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because the amount of $83,700 results from subtracting interest expense for a full year.

A firm that often factors its accounts receivable has an agreement with its finance company that requires the firm to maintain a 6% reserve and charges a 1.4% commission on the amount of the receivables. The net proceeds would be further reduced by an annual interest charge of 15% on the monies advanced. Assuming a 360-day year, what amount of cash (rounded to the nearest dollar) will the firm receive from the finance company at the time a $100,000 account that is due in 60 days is turned over to the finance company?

A. $92,600  
B. $96,135  
C. $90,285  
D. $85,000  

Answer (A) is incorrect because the amount of $92,600 results from failing to consider the interest expense.

Answer (B) is incorrect because the amount of $96,135 results from failing to subtract the 6% reserve.
Answer (C) is correct. The first step is to calculate the gross proceeds the firm will receive from the factoring transaction:

\[
\begin{align*}
\text{Amount of receivable} & \quad \$100,000 \\
\text{Less: reserve ($100,000 \times 6\%)} & \quad (6,000) \\
\text{Less: factor fee ($100,000 \times 1.4\%)} & \quad (1,400) \\
\text{Gross proceeds} & \quad \$ 92,600
\end{align*}
\]

This amount must be reduced by the interest charged on the gross proceeds:

\[
\begin{align*}
\text{Gross proceeds} & \quad $92,600 \\
\text{Times: annual finance charge} & \quad \times 15\% \\
\text{Annualized interest expense} & \quad $13,890 \\
\text{Times: portion of year (60 days ÷ 360 days)} & \quad \times 16.7\% \\
\text{Interest expense} & \quad \$ 2,315
\end{align*}
\]

The actual cash the firm will receive from this factoring transaction is thus calculated as follows:

\[
\begin{align*}
\text{Gross proceeds} & \quad $92,600 \\
\text{Less: interest expense} & \quad (2,315) \\
\text{Net proceeds} & \quad \$90,285
\end{align*}
\]

Answer (D) is incorrect because the amount of $85,000 assumes that the only amount withheld is a full year’s interest on $100,000.

Gatsby, Inc., is going to begin factoring its accounts receivable and has collected information on the following four finance companies:

<table>
<thead>
<tr>
<th></th>
<th>Required Reserves</th>
<th>Commissions</th>
<th>Annual Interest Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>6%</td>
<td>1.4%</td>
<td>15%</td>
</tr>
<tr>
<td>Company B</td>
<td>7%</td>
<td>1.2%</td>
<td>12%</td>
</tr>
<tr>
<td>Company C</td>
<td>5%</td>
<td>1.7%</td>
<td>20%</td>
</tr>
<tr>
<td>Company D</td>
<td>8%</td>
<td>1.0%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Which company will give Gatsby the highest initial proceeds from a $100,000 account due in 60 days? Assume a 360-day year.

A. Company A.  
B. Company B.  
C. Company C.  
D. Company D.
Answer (A) is correct. The first step is to calculate the gross proceeds the firm will receive from the factoring transaction:

<table>
<thead>
<tr>
<th>Company</th>
<th>Amount of receivable $100,000</th>
<th>Less: reserve $6,000</th>
<th>Less: factor fee $1,400</th>
<th>Gross proceeds $92,600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>$100,000</td>
<td>(6,000)</td>
<td>(1,400)</td>
<td>$92,600</td>
</tr>
<tr>
<td>Company B</td>
<td>$100,000</td>
<td>(7,000)</td>
<td>(1,200)</td>
<td>$91,800</td>
</tr>
<tr>
<td>Company C</td>
<td>$100,000</td>
<td>(5,000)</td>
<td>(1,700)</td>
<td>$93,300</td>
</tr>
<tr>
<td>Company D</td>
<td>$100,000</td>
<td>(8,000)</td>
<td>(1,000)</td>
<td>$91,000</td>
</tr>
</tbody>
</table>

These amounts must be reduced by the interest charged on gross proceeds:

<table>
<thead>
<tr>
<th>Company</th>
<th>Gross proceeds $92,600</th>
<th>Times: annual finance charge × 15%</th>
<th>Annualized interest exp. $13,890</th>
<th>Times: portion of year (60 ÷ 360) × 16.7%</th>
<th>Interest expense $2,315</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>$92,600</td>
<td>× 15%</td>
<td>$13,890</td>
<td>× 16.7%</td>
<td>$2,315</td>
</tr>
<tr>
<td>Company B</td>
<td>$91,800</td>
<td>× 12%</td>
<td>$11,016</td>
<td>× 16.7%</td>
<td>$1,836</td>
</tr>
<tr>
<td>Company C</td>
<td>$93,300</td>
<td>× 20%</td>
<td>$18,660</td>
<td>× 16.7%</td>
<td>$3,110</td>
</tr>
<tr>
<td>Company D</td>
<td>$91,000</td>
<td>× 5%</td>
<td>$4,550</td>
<td>× 16.7%</td>
<td>$758</td>
</tr>
</tbody>
</table>

The actual cash the firm will receive from this factoring transaction is thus calculated as follows:

<table>
<thead>
<tr>
<th>Company</th>
<th>Gross proceeds $92,600</th>
<th>Less: interest expense $(2,315)</th>
<th>Net proceeds $90,285</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>$92,600</td>
<td>(2,315)</td>
<td>$90,285</td>
</tr>
<tr>
<td>Company B</td>
<td>$91,800</td>
<td>(1,836)</td>
<td>$90,964</td>
</tr>
<tr>
<td>Company C</td>
<td>$93,300</td>
<td>(3,110)</td>
<td>$90,190</td>
</tr>
<tr>
<td>Company D</td>
<td>$91,000</td>
<td>(758)</td>
<td>$90,242</td>
</tr>
</tbody>
</table>

The highest initial proceeds will be received from Company A.

- Answer (B) is incorrect because Company B will produce proceeds of only $89,964.
- Answer (C) is incorrect because Company C will produce proceeds of only $90,190.
- Answer (D) is incorrect because Company D will produce proceeds of only $90,242.

[Fact Pattern #76]

The Frame Supply Company has just acquired a large account and needs to increase its working capital by $100,000. The controller of the company has identified the four sources of funds given below:

1. Pay a factor to buy the company’s receivables, which average $125,000 per month and have an average collection period of 30 days. The factor will advance up to 80% of the face value of receivables at 10% and charge a fee of 2% on all receivables purchased. The controller estimates that the firm would save $24,000 in collection expenses over the year. Assume the fee and interest are not deductible in advance.
2. Borrow $110,000 from a bank at 12% interest. A 9% compensating balance would be required.
3. Issue $110,000 of 6-month commercial paper to net $100,000. (New paper would be issued every 6 months.)
4. Borrow $125,000 from a bank on a discount basis at 20%. No compensating balance would be required.

Assume a 360-day year in all of your calculations.
The cost of Alternative 1 to Frame Supply Company is

A. 10.0%
B. 12.0%
C. 13.2%
D. 16.0%

- Answer (A) is incorrect because the interest rate on the amount advanced is 10%.
- Answer (B) is incorrect because the sum of the interest rate and the fee percentage is 12%.
- Answer (C) is incorrect because the cost of Alternative 2 is 13.2%.
- Answer (D) is correct.

The first step is to calculate the amount the firm will receive from the factoring transaction:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of receivables</td>
<td>$125,000</td>
</tr>
<tr>
<td>Times: advance percentage</td>
<td>× 80%</td>
</tr>
<tr>
<td>Amount received</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

This amount is the basis for the calculation of interest expense:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount advanced</td>
<td>$100,000</td>
</tr>
<tr>
<td>Times: annual finance charge</td>
<td>× 10%</td>
</tr>
<tr>
<td>Annual interest expense</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

The next step is to calculate the annual factor fee:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of receivables</td>
<td>$125,000</td>
</tr>
<tr>
<td>Times: factor fee percentage</td>
<td>× 2%</td>
</tr>
<tr>
<td>Monthly factor fee</td>
<td>$2,500</td>
</tr>
<tr>
<td>Times: months</td>
<td>× 12</td>
</tr>
<tr>
<td>Annual factor fee</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

The annual net cost of this factoring transaction is calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual interest expense</td>
<td>$10,000</td>
</tr>
<tr>
<td>Annual factor fee</td>
<td>30,000</td>
</tr>
<tr>
<td>Less: annual savings</td>
<td>(24,000)</td>
</tr>
<tr>
<td>Annual net cost</td>
<td>$16,000</td>
</tr>
</tbody>
</table>

As with all financing arrangements, the effective rate is the ratio of the amount the firm must pay to the amount the firm gets use of:

\[
\text{Effective rate} = \frac{\text{Net cost}}{\text{Usable funds}}
\]
\[
= \frac{16,000}{100,000}
\]
\[
= 16.0\%
\]
The cost of Alternative 2 to Frame Supply Company is

A. 9.0%
B. 12.0%
C. 13.2%
D. 21.0%

- Answer (A) is incorrect because the compensating balance requirement is 9.0%.
- Answer (B) is incorrect because the contract rate is 12.0%.
- Answer (C) is correct. The effective interest rate on a loan that requires a compensating balance can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{1 - \text{Compensating balance \%}} = \frac{12\%}{100\% - 9\%} = \frac{12\%}{91\%} = 13.19\%
\]

- Answer (D) is incorrect because this percentage is the sum of the contract rate and the compensating balance requirement.

The cost of Alternative 3 to Frame Supply Company is

A. 9.1%
B. 10.0%
C. 18.2%
D. 20.0%

- Answer (A) is incorrect because this percentage is the 6-month rate based on the face amount of the paper.
- Answer (B) is incorrect because the rate for 6 months is 10.0%.
- Answer (C) is incorrect because this percentage is based on the face amount of the commercial paper.
- Answer (D) is correct. By issuing commercial paper, the company will receive $100,000 and repay $110,000 every 6 months. Thus, for the use of $100,000 in funds, the company pays $10,000 in interest each 6-month period, or a total of $20,000 per year. The annual percentage rate can therefore be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Interest expense}}{\text{Usable funds}} = \frac{20,000}{100,000} = 20.0\%
\]

The cost of Alternative 4 to Frame Supply Company is

A. 20.0%
B. 25.0%
C. 40.0%
D. 50.0%
Answer (A) is incorrect because the effective rate must exceed the contract rate of 20%.

Answer (B) is correct. The company will receive $100,000 ($125,000 × 80%) at an annual cost of $25,000 ($125,000 – $100,000). The effective interest rate on this loan can thus be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Interest expense}}{\text{Usable funds}} = \frac{25,000}{100,000} = 25.0\%
\]

Answer (C) is incorrect because this percentage assumes no discount and a 6-month loan term.

Answer (D) is incorrect because this percentage assumes a 6-month loan term.

A company enters into an agreement with a firm that will factor the company’s accounts receivable. The factor agrees to buy the company’s receivables, which average $100,000 per month and have an average collection period of 30 days. The factor will advance up to 80% of the face value of receivables at an annual rate of 10% and charge a fee of 2% on all receivables purchased. The controller of the company estimates that the company would save $18,000 in collection expenses over the year. Fees and interest are not deducted in advance. Assuming a 360-day year, what is the annual cost of financing?

A. 10.0%
B. 12.0%
C. 14.0%
D. 17.5%

Answer (A) is incorrect because this percentage overlooks the factor fee.

Answer (B) is incorrect because this percentage overlooks the fact that the 2% fee recurs every month.

Answer (C) is incorrect because this percentage miscalculates the factor fee and the savings from reduced collection costs.
Answer (D) is correct. The first step is to calculate the amount the firm will receive from the factoring transaction:

Amount of receivables $100,000
Times: advance percentage × 80%
Amount received $80,000

This amount is the basis for the calculation of interest expense:

Amount advanced $80,000
Times: annual finance charge × 10%
Annualized interest expense $8,000

The next step is to calculate the net outlay:

Amount of receivables $100,000
Times: factor fee percentage × 2%
Monthly factor fee $2,000
Times: months × 12
Annual factor fee $24,000
Less: annual savings (18,000)
Net outlay $6,000

Now the net cost in dollar terms can be determined:

Annualized interest expense $8,000
Net outlay 6,000
Annual net cost $14,000

As with all financing arrangements, the effective rate is the ratio of the amount the firm must pay to the amount the firm gets use of:

Effective rate = Net cost ÷ Usable funds
= $14,000 ÷ $80,000
= 17.5%

[783] Merkle, Inc., has a temporary need for funds. Management is trying to decide between not taking discounts from one of their three biggest suppliers, or a 14.75% per annum renewable discount loan from its bank for 3 months. The suppliers’ terms are as follows:

Fort Co. 1/10, net 30
Riley Manufacturing Co. 2/15, net 60
Shad, Inc. 3/15, net 90

Using a 360-day year, the cheapest source of short-term financing in this situation is

A. The bank.
B. Fort Co.
C. Riley Manufacturing Co.
D. Shad, Inc.
Answer (A) is incorrect because the bank does not offer the lowest cost source of financing.
Answer (B) is incorrect because not paying Fort Co.’s invoices on time is not the lowest cost source of financing.
Answer (C) is incorrect because not paying Riley Manufacturing Co.’s invoices on time is not the lowest cost source of financing.
Answer (D) is correct. The annualized costs of not taking the discounts offered by these suppliers can be calculated using this formula:

\[
\text{Cost of not taking discount} = \left( \frac{\text{Discount \%}}{100\% - \text{Discount \%}} \right) \times \frac{\text{Total payment period} - \text{Discount period}}{\text{Days in year}}
\]

**Fort Co.:**

\[
\text{Cost of not taking discount} = \left( \frac{1\%}{99\%} \right) \times \frac{360 \text{ days} - 10 \text{ days}}{20 \text{ days}}
\]

\[
= 1.01\% \times 18
\]

\[
= 18.18\%
\]

**Riley:**

\[
\text{Cost of not taking discount} = \left( \frac{2\%}{98\%} \right) \times \frac{360 \text{ days} - 15 \text{ days}}{45 \text{ days}}
\]

\[
= 2.04\% \times 8
\]

\[
= 16.32\%
\]

**Shad, Inc.:**

\[
\text{Cost of not taking discount} = \left( \frac{3\%}{97\%} \right) \times \frac{360 \text{ days} - 15 \text{ days}}{75 \text{ days}}
\]

\[
= 3.09\% \times 4.8
\]

\[
= 14.83\%
\]

The bank loan was quoted at 14.75% on a discount basis. On a $100 note, the borrower would only receive $85.25, resulting in an effective rate of 17.30% ($14.75 ÷ $85.25). Thus, not paying Shad, Inc.’s invoices on time would be the lowest cost source of capital, at a cost of 14.83%.

The chief financial officer of Smith Glass, Inc., follows the policy of matching the maturity of assets with the maturity of financing. The implications of this policy include all of the following, except that

A. The minimum level of cash, receivables, and inventory required to stay in business can be considered permanent and financed with long-term debt or equity.
B. Cash, receivables, and inventory should be financed with long-term debt or equity.
C. Long-term assets, like plant and equipment, should be financed with long-term debt or equity.
D. Answer (A) is incorrect because anticipating seasonal changes in the need for short-term assets is one of the reasons for maturity matching.
   
Answer (B) is incorrect because minimum levels of assets required to stay in business are correctly financed with long-term debt or equity.
   
Answer (C) is correct. Arranging a portfolio so that the maturity of funds will coincide with the need for funds (called maturity matching) will maximize the average return on the portfolio and provide increased flexibility. Supporting short-term assets, such as cash and receivables, with long-term financing is risky and counterproductive.
   
Answer (D) is incorrect because long-term assets are financed with long-term debt or equity.
Burke Industries has a revolving credit arrangement with its bank that specifies that Burke can borrow up to $5 million at an annual interest rate of 9% payable monthly. In addition, Burke must pay a commitment fee of 0.25% per month on the unused portion of the line, payable monthly. Burke expects to have a $2 million cash balance and no borrowings against this line of credit on April 1, net cash inflows of $2 million in April, net outflows of $7 million in May, and net inflows of $4 million in June. If all cash flows occur at the end of the month, approximately how much will Burke pay to the bank during the second quarter related to this revolving credit arrangement?

A. $47,600  
B. $52,600  
C. $60,100  
D. $62,500

- Answer (A) is incorrect because the amount of $47,600 approximates the cost of the credit arrangement minus the commitment fee for June.
- Answer (B) is correct. Burke’s cash inflows, outflows, and balances for the quarter are presented in this table:

<table>
<thead>
<tr>
<th></th>
<th>April Activity</th>
<th>May Activity</th>
<th>June Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflows</td>
<td></td>
<td></td>
<td>$3,012,500</td>
</tr>
<tr>
<td>Outflows</td>
<td>$2,000,000</td>
<td>$4,000,000</td>
<td></td>
</tr>
<tr>
<td>Balance</td>
<td></td>
<td>(3,000,000)</td>
<td></td>
</tr>
<tr>
<td>unused</td>
<td>$5,000,000</td>
<td>$1,987,500</td>
<td></td>
</tr>
<tr>
<td>Times: fee percentage</td>
<td>$5,000,000</td>
<td>$1,987,500</td>
<td></td>
</tr>
<tr>
<td>Interest expense</td>
<td>$22,594</td>
<td>$22,594</td>
<td></td>
</tr>
<tr>
<td>Expense rate</td>
<td>$0.75%</td>
<td>$0.25%</td>
<td>$0.25%</td>
</tr>
<tr>
<td>Commitment fees</td>
<td>$12,500</td>
<td>$12,500</td>
<td>$4,969</td>
</tr>
<tr>
<td>Totals</td>
<td>$12,500</td>
<td>$12,500</td>
<td>$27,563</td>
</tr>
</tbody>
</table>

Burke will therefore pay the bank $52,563 during the second quarter ($12,500 + $12,500 + $27,563).

- Answer (C) is incorrect because the amount of $60,100 approximates the cost of the credit arrangement if the June commitment fee is based on the maximum amount of the line of credit.
- Answer (D) is incorrect because the amount of $62,500 is based on the assumption that the maximum amount was borrowed in June.

A manufacturer with seasonal sales would be most likely to obtain which one of the following types of loans from a commercial bank to finance the need for a fixed amount of additional capital during the busy season?

A. Transaction loan.  
B. Insurance company term loan.  
C. Installment loan.  
D. Unsecured short-term term loan.
Answer (A) is incorrect because a transaction loan is used to finance a single large transaction rather than a firm’s continuing working capital needs.

Answer (B) is incorrect because insurers normally make long-term, not short-term, loans.

Answer (C) is incorrect because an installment loan ordinarily is used to purchase high-cost items such as fixed assets.

Answer (D) is correct. An unsecured short-term loan is often used to finance a firm’s need for fluctuating (e.g., seasonal) current assets. This practice is consistent with the maturity-matching (self-liquidating) approach to financing current assets.

[787] Which of the following financing vehicles would a commercial bank be likely to offer to its customers?

I. Discounted notes
II. Term loans
III. Lines of credit
IV. Self-liquidating loans

A. I and II.
B. III and IV.
C. I, III, and IV.
D. I, II, III, and IV.

Answer (A) is incorrect because lines of credit and self-liquidating loans are also available from commercial banks.

Answer (B) is incorrect because discounted notes and term loans are also available from commercial banks.

Answer (C) is incorrect because term loans are also available from commercial banks.

Answer (D) is correct. All of the financing methods listed are available from commercial banks.

[788] On June 30 of this year, Mega Bank granted Lang Corporation a $20 million 5-year term loan with a floating rate of 200 basis points over Treasury Bill rates, payable quarterly. The loan principal is to be repaid in equal quarterly installments over the term. If Treasury Bills are expected to yield 6% for the rest of the year, how much will Lang pay to Mega Bank in the last half of the year?

A. $1,800,000
B. $2,780,000
C. $2,800,000
D. $3,170,000

Answer (A) is incorrect because the amount of $1,800,000 results from failing to include the second principal payment and from calculating the second interest payment on the full $20,000,000.

Answer (B) is correct. A basis point is one-hundredth of 1%. Thus, the rate on the term loan is 8% [6% treasury bill rate + 200 basis points (2%)]. The first quarterly payment consists of principal of $1,000,000 and interest of $400,000 ($20,000,000 × 8%) × (3 ÷ 12 months)], a total of $1,400,000. The second quarterly payment consists of principal of $1,000,000 and interest of $380,000 [($20,000,000 – $1,000,000) × 8% × (3 ÷ 12 months)], a total of $1,380,000. The total payments in the second half of the year are therefore $2,780,000 ($1,400,000 + $1,380,000).

Answer (C) is incorrect because the amount of $2,800,000 results from calculating the second interest payment on the full $20,000,000.

Answer (D) is incorrect because the amount of $3,170,000 results from using a 12% interest rate.
Megatech, Inc., is a large publicly-held firm. The treasurer is making an analysis of the short-term financing options available for the third quarter, as the company will need an average of $8 million for the month of July, $12 million for August, and $10 million for September. The following options are available:

I. Issue commercial paper on July 1 in an amount sufficient to net Megatech $12 million at an effective rate of 7% per year. Any temporarily excess funds will be deposited in Megatech’s investment account at First City Bank and earn interest at an annual rate of 4%.

II. Utilize a line of credit from First City Bank with interest accruing monthly on the amount utilized at the prime rate, which is estimated to be 8% in July and August and 8.5% in September.

Based on this information, which one of the following actions should the treasurer take?

A. Issue commercial paper, since it is approximately $35,000 less expensive than the line of credit.

B. Issue commercial paper, since it is approximately $14,200 less expensive than the line of credit.

C. Use the line of credit, since it is approximately $15,000 less expensive than issuing commercial paper.

D. Use the line of credit, since it is approximately $5,800 less expensive than issuing commercial paper.

- Answer (A) is incorrect because Calculating that the commercial paper is $35,000 less expensive than the line of credit results from (1) ignoring the interest earned on unused funds and (2) assuming that $12,000,000 of the line of credit is used each month.

- Answer (B) is correct. The cost of Option I can be calculated as follows:

<table>
<thead>
<tr>
<th>Amount</th>
<th>Rate</th>
<th>Fraction of Year</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest expense for quarter</td>
<td>$12,000,000 × 7.0% ÷ 4 = $210,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less: int. earned in July</td>
<td>(4,000,000) × 4.0% ÷ 12 = (13,333)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less: int. earned in Sept.</td>
<td>(2,000,000) × 4.0% ÷ 12 = (6,667)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net cost of Opt. I</td>
<td>$190,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The cost of Option II can be calculated as follows:

<table>
<thead>
<tr>
<th>Amount</th>
<th>Rate</th>
<th>Fraction of Year</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest expense for July</td>
<td>$ 8,000,000 × 8.0% ÷ 12 = $ 53,333</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest expense for August</td>
<td>12,000,000 × 8.0% ÷ 12 = 80,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest expense for Sept.</td>
<td>10,000,000 × 8.5% ÷ 12 = 70,833</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net cost of Opt. II</td>
<td>$204,167</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Megatech’s better choice is the commercial paper because it costs $14,200 less than the line of credit ($204,167 – $190,000).

- Answer (C) is incorrect because The line of credit is more expensive.

- Answer (D) is incorrect because The line of credit is more expensive.

Global Manufacturing Company has a cost of borrowing of 12%. One of the firm’s suppliers has just offered new terms for purchases. The old terms were cash on delivery and the new terms are 2/10, net 45. Should Global pay within the first 10 days?

A. Yes, the cost of not taking the trade discount exceeds the cost of borrowing.

B. No, the cost of trade credit exceeds the cost of borrowing.

C. No, the use of debt should be avoided if possible.

D. The answer depends on whether the firm borrows money.
Answer (A) is correct. The following is the formula for the annualized cost of not taking a discount:

\[
\frac{\text{Discount \%}}{100\% - \text{Discount \%}} \times \frac{\text{Days in year}}{\text{Total payment period} - \text{Discount period}}
\]

Whether to pay within the discount period is determined by the following calculation:

Cost of not taking discount = \(\frac{2\%}{98\%} \times \frac{360\text{ days}}{35\text{ days}}\)

\[= 2.04\% \times 10.286\]

\[= 20.98\%\]

The cost of not taking the discount is higher than the cost of borrowing. The firm should take the discount.

- Answer (B) is incorrect because The cost of trade credit is lower than the cost of borrowing.
- Answer (C) is incorrect because Debt is useful for financing.
- Answer (D) is incorrect because The correct decision can be determined with the information provided.

Dexter Products receives $25,000 worth of merchandise from its major supplier on the 15th and 30th of each month. The goods are sold on terms of 1/15, net 45, and Dexter has been paying on the net due date and foregoing the discount. A local bank offered Dexter a loan at an interest rate of 10%. What will be the net annual savings to Dexter if it borrows from the bank and utilizes the funds to take advantage of the trade discount?

A. $(950)
B. $1,050
C. $7,050
D. $2,250

- Answer (A) is incorrect because The amount of $(950) is based on the assumption that the discount period is 45 days.
- Answer (B) is correct. The annualized cost of not taking a discount can be calculated with the following formula:

\[
\frac{\text{Discount \%}}{100\% - \text{Discount \%}} \times \frac{\text{Days in year}}{\text{Total payment period} - \text{Discount period}}
\]

Cost of not taking discount = \(\frac{1\%}{99\%} \times \frac{360\text{ days}}{30\text{ days}}\)

\[= 01.0101\% \times 12\]

\[= 12.1212\%\]

To take the discount, the firm can use a succession of loans to pay $49,500 ($50,000 × 99%) each month at a cost of $4,950 ($49,500 × 10% annualized rate). If it does not take the discount, it pays $6,000 per year ($49,500 × 12.1212% annualized rate) for a succession of 30-day loans. Thus, borrowing saves $1,050 ($6,000 – $4,950).

- Answer (C) is incorrect because The amount of $7,050 is based on the assumption that the discount period is 15 days.
- Answer (D) is incorrect because The amount of $2,250 is based on the assumption that the cost of not taking the discount is approximately 14.5%.
Dudley Products is given terms of 2/10, net 45 by its suppliers. If Dudley forgoes the cash discount and instead pays the suppliers 5 days after the net due date with no penalty, what is the annual interest rate cost (using a 360-day year)?

A. 18.0%
B. 18.4%
C. 21.0%
D. 24.5%

- Answer (A) is incorrect because the rate of 18.0% results from failing to divide the discount rate by (1.0 – discount rate).
- Answer (B) is correct. The annualized cost of not taking a discount can be calculated with the following formula:

\[
\text{Cost of not taking discount} = \left(\frac{\text{Discount \%}}{100\% - \text{Discount \%}}\right) \times \frac{\text{Days in year}}{\text{Total payment period} - \text{Discount period}}
\]

\[
\begin{align*}
\text{Cost of not taking discount} &= \left(\frac{2\%}{100\% - 2\%}\right) \times \frac{360 \text{ days}}{40 \text{ days}} \\
&= 2.04\% \times 9 \\
&= 18.36\%
\end{align*}
\]

- Answer (C) is incorrect because the rate of 21.0% results from using the agreed-to discount period rather than the self-extended discount period.
- Answer (D) is incorrect because the rate of 24.5% results from using a 30-day discount period.

A firm is given payment terms of 3/10, net 90 and forgoes the discount and pays on the net due date. Using a 360-day year and ignoring the effects of compounding, what is the effective annual interest rate cost?

A. 12.0%
B. 12.4%
C. 13.5%
D. 13.9%

- Answer (A) is incorrect because the rate of 12.0% results from failing to subtract the discount period and failing to divide the discount rate by (1.0 – discount rate).
- Answer (B) is incorrect because the rate of 12.4% results from failing to subtract the discount period.
- Answer (C) is incorrect because the rate of 13.5% results from failing to divide the discount rate by (1.0 – discount rate).
- Answer (D) is correct. The annualized cost of not taking a discount can be calculated with the following formula:

\[
\text{Cost of not taking discount} = \left(\frac{\text{Discount \%}}{100\% - \text{Discount \%}}\right) \times \frac{\text{Days in year}}{\text{Total payment period} - \text{Discount period}}
\]

\[
\begin{align*}
\text{Cost of not taking discount} &= \left(\frac{3\%}{100\% - 3\%}\right) \times \frac{360 \text{ days}}{80 \text{ days}} \\
&= (3\% \div 97\%) \times (360 \text{ days} \div 80 \text{ days}) \\
&= 3.09\% \times 4.5 \\
&= 13.905\%
\end{align*}
\]
Lang National Bank offered a 1-year loan to a commercial customer. The instrument is a discounted note with a nominal rate of 12%. What is the effective interest rate to the borrower?

A. 10.71%
B. 12.00%
C. 13.20%
D. 13.64%

- Answer (A) is incorrect because the rate of 10.71% results from adding, rather than subtracting, the stated rate to 1.0.
- Answer (B) is incorrect because the rate of 12.00% results from failing to divide the stated rate by (1.0 – stated rate).
- Answer (C) is incorrect because the rate of 13.20% results from dividing the stated rate by .91 rather than (1.0 – stated rate).
- Answer (D) is correct. In the absence of a compensating balance provision, the effective annual rate on a loan can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{1.0 - \text{stated rate}}
\]

\[
= \frac{12\%}{(100\% - 12\%)}
\]

\[
= \frac{12\%}{88\%}
\]

\[
= 13.64\%
\]

Gates, Inc., has been offered a 1-year loan by its commercial bank. The instrument is a discounted note with a stated interest rate of 9%. If Gates needs $300,000 for use in the business, what should the face value of the note be?

A. $275,229
B. $327,000
C. $300,000
D. $329,670

- Answer (A) is incorrect because the amount of $275,229 results from adding, rather than subtracting, the stated rate in the denominator.
- Answer (B) is incorrect because the amount of $327,000 results from treating the transaction as a simple interest loan rather than as a discounted loan.
- Answer (C) is incorrect because the amount of $300,000 is the amount needed.
- Answer (D) is correct. The face amount of a loan with discounted (paid in advance) interest can be calculated as follows:

\[
\text{Total borrowings} = \frac{\text{Amount needed}}{1.0 - \text{stated rate}}
\]

\[
= \frac{300,000}{1.0 - .09}
\]

\[
= \frac{300,000}{.91}
\]

\[
= 329,670
\]
Keller Products needs $150,000 of additional funds over the next year in order to satisfy a significant increase in demand. A commercial bank has offered Keller a 1-year loan at a nominal rate of 8%, which requires a 15% compensating balance. How much would Keller have to borrow, assuming it would need to cover the compensating balance with the loan proceeds?

A. $130,435  
B. $172,500  
C. $176,471  
D. $194,805

- Answer (A) is incorrect because the amount of $130,435 results from using 1.0 plus, rather than minus, the compensating balance percentage in the denominator.
- Answer (B) is incorrect because the amount of $172,500 results from using 1.0 plus, rather than minus, the compensating balance percentage in the denominator, then multiplying rather than dividing.
- Answer (C) is correct. The face amount of a loan with a compensating balance can be calculated as follows:

\[
\text{Total borrowings} = \frac{\text{Amount needed}}{1 - \text{compensating balance \%}} = \frac{150,000}{1 - 15\%} = 150,000 \div 85\% = $176,471
\]

- Answer (D) is incorrect because the amount of $194,805 results from using 23% as the compensating balance percentage.

Approximately what amount of compensating balance would be required for a stated interest rate of 10% to equal an effective interest rate of 10.31% on a $100,000,000 1-year loan?

A. $310,000  
B. $3,000,000  
C. $3,100,000  
D. Not enough information is given.

- Answer (A) is incorrect because the amount of $310,000 results from subtracting the stated rate from the effective rate and moving the decimal.
- Answer (B) is correct. The compensating balance percentage can be calculated as follows:

\[
\text{Stated rate} \div (1.0 - \text{compensating balance \%}) = \text{Effective rate}
\]

\[
10\% \div (100\% - \text{CB\%}) = 10.31\%
\]

\[
10.31\% - 10.31\text{CB\%} = 10\%
\]

\[
10.31\text{CB\%} = .31\%
\]

\[
\text{CB\%} = 3\%
\]

The amount of the compensating balance is therefore $3,000,000 ($100,000,000 \times 3\%).

- Answer (C) is incorrect because the amount of $3,100,000 results from subtracting the stated rate from the effective rate.
- Answer (D) is incorrect because enough information is provided to determine the compensating balance.
The effective annual interest rate to the borrower of a $100,000 1-year loan with a stated rate of 7% and a 20% compensating balance is

A. 7.0% 
B. 8.4% 
C. 8.75% 
D. 13.0%

- Answer (A) is incorrect because the rate of 7.0% results from failing to consider the effect of the compensating balance.
- Answer (B) is incorrect because the rate of 8.4% assumes a compensating balance percentage of 16.7%.
- Answer (C) is correct. The firm’s effective rate on this loan can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{(1.0 - \text{compensating balance \%})} \\
= \frac{7\%}{(100\% - 20\%)} \\
= \frac{7\%}{80\%} \\
= 8.75\%
\]

The amount of the loan is not needed to calculate the effective rate.
- Answer (D) is incorrect because the rate of 13.0% results from subtracting the stated rate from the compensating balance rate.

Todd Manufacturing Company needs a $100 million loan for 1 year. Todd’s banker has presented two alternatives as follows:

- Option #1 – Loan with a stated interest rate of 10.25%. No compensating balance required.
- Option #2 – Loan with a stated interest rate of 10.00%. Non-interest bearing compensating balance required.

Which of the following compensating balances, withheld from the loan proceeds, would result in Option #2 having an effective interest rate equal to the 10.25% rate of Option #1?

A. $250,000
B. $2,440,000
C. $2,500,000
D. $10,250,000

- Answer (A) is incorrect because the amount of $250,000 results from subtracting the stated rate from the effective rate and moving the decimal.
- Answer (B) is correct. The appropriate compensating balance percentage can be calculated as follows:

\[
\text{Stated rate} ÷ (1.0 - \text{compensating balance \%}) = \text{Effective rate} \\
10\% ÷ (100\% – \text{CB\%}) = 10.25\% \\
10.25\% – 10.25\text{CB\%} = 10\% \\
10.25\text{CB\%} = .25\% \\
\text{CB\%} = 2.44\%
\]

The amount of the compensating balance is therefore $2,440,000 ($100,000,000 × 2.44%).
- Answer (C) is incorrect because the amount of $2,500,000 results from subtracting the stated rate from the effective rate.
Frame Industries has arranged a revolving line of credit for the upcoming year with a commercial bank. The arrangement is for $20 million, with interest payable monthly on the amount utilized at the bank’s prime rate and an annual commitment fee of one-half of 1 percent, computed and payable monthly on the unused portion of the line. Frame estimates that the prime rate for the upcoming year will be 8%, and expects the following average amount to be borrowed by quarter:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Amount Borrowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>$10,000,000</td>
</tr>
<tr>
<td>Second</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Third</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Fourth</td>
<td>5,000,000</td>
</tr>
</tbody>
</table>

How much will Frame pay to the bank next year in interest and fees?

A. $1,118,750  
B. $1,131,250  
C. $1,168,750  
D. $1,200,000

Answer (A) is incorrect because the amount of $1,118,750 results from failing to include the commitment fee for the first quarter.  
Answer (B) is correct. Frame’s prime rate on a quarterly basis is 2% (8% ÷ 4 quarters), and the quarterly commitment fee is 0.125% (0.5% ÷ 4 quarters). Frame’s total charges for interest and fees for next year by quarter can be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>First Quarter</th>
<th>Second Quarter</th>
<th>Third Quarter</th>
<th>Fourth Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used portion</td>
<td>$10,000,000</td>
<td>$20,000,000</td>
<td>$20,000,000</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Times: interest rate</td>
<td>× 2%</td>
<td>× 2%</td>
<td>× 2%</td>
<td>× 2%</td>
</tr>
<tr>
<td>Interest expense</td>
<td>$200,000</td>
<td>$400,000</td>
<td>$400,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Unused portion</td>
<td>$10,000,000</td>
<td>$0</td>
<td>$0</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>Times: fee percentage</td>
<td>× 0.125%</td>
<td>× 0.125%</td>
<td>× 0.125%</td>
<td>× 0.125%</td>
</tr>
<tr>
<td>Commitment fees</td>
<td>$12,500</td>
<td>$0</td>
<td>$0</td>
<td>$18,750</td>
</tr>
<tr>
<td>Totals</td>
<td>$212,500</td>
<td>$400,000</td>
<td>$400,000</td>
<td>$118,750</td>
</tr>
</tbody>
</table>

Frame will pay the bank $1,131,250 in interest and fees next year ($212,500 + $400,000 + $400,000 + $118,750).

Answer (C) is incorrect because the amount of $1,168,750 results from including an additional commitment fee.  
Answer (D) is incorrect because the amount of $1,200,000 results from overstating the commitment fee.

What is the effective annual interest rate for a 1-year $100 million loan with a stated interest rate of 8.00%, if the lending bank requires a non-interest bearing compensating balance in the amount of $5 million?

A. 7.62%  
B. 8.00%  
C. 8.42%  
D. 13.00%
• Answer (A) is incorrect because The effective rate exceeds the stated rate when a compensating balance is required.
• Answer (B) is incorrect because The rate of 8.00% is the stated rate.
• Answer (C) is correct. The bank requires a compensating balance of 5% ($5 million ÷ $100 million). The firm’s effective rate on this loan can be calculated as follows:

\[
\text{Effective rate} = \frac{\text{Stated rate}}{(1.0 - \text{compensating balance \%})} = \frac{8\%}{(100\% - 5\%)} = \frac{8\%}{95\%} = 8.42\%
\]

The amount of the loan is not needed to calculate the effective rate.
• Answer (D) is incorrect because The rate of 13.00% is the sum of the stated rate and the compensating balance percentage.

[802] Which one of the following could be used to provide security to the lender in an inventory financing situation?

A. Trust receipt.
B. Factoring.
C. Lockbox.
D. Underwriting.

• Answer (A) is correct. A trust receipt is an instrument issued by a borrower that provides inventory as collateral. It is signed by the borrower and acknowledges that (1) the inventory is held in trust for the lender, and (2) any proceeds of sale are to be paid to the lender.
• Answer (B) is incorrect because Factoring is a means of financing receivables. It provides no security to the lender.
• Answer (C) is incorrect because A lockbox merely speeds up receipts. It does not provide security.
• Answer (D) is incorrect because Underwriting is a means of selling securities. It is unrelated to inventory financing.

[803] Mandel, Inc., has a zero-balance account with a commercial bank. The bank sweeps any excess cash into a commercial investment account earning interest at the rate of 4% per year, payable monthly. When Mandel has a cash deficit, a line of credit is used that has an interest rate of 8% per year, payable monthly based on the amount used. Mandel expects to have a $2 million cash balance on January 1 of next year. Net cash flows for the first half of the year, excluding the effects of interest received or paid, are forecasted (in millions of dollars) as follows:

<table>
<thead>
<tr>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
</tr>
</thead>
<tbody>
<tr>
<td>+2</td>
<td>+1</td>
<td>-5</td>
<td>-3</td>
<td>-2</td>
<td>+6</td>
</tr>
</tbody>
</table>

Assuming all cash flows occur at the end of each month, approximately how much interest will Mandel incur for this period?

A. $16,000 net interest paid.
B. $53,000 net interest paid.
C. $76,000 net interest paid.
D. $195,000 net interest paid.
Answer (A) is correct. The interest incurred on this financing arrangement can be calculated as follows:

<table>
<thead>
<tr>
<th>Activity and Balances</th>
<th>Annual Rate</th>
<th>Months in Year</th>
<th>Monthly Interest Income/Expense</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning balance</td>
<td>$2,000,000×4%÷12= $6,667</td>
<td>12</td>
<td>$6,667</td>
</tr>
<tr>
<td>January inflows</td>
<td>2,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>February balance</td>
<td>$4,000,000×4%÷12= 13,333</td>
<td>12</td>
<td>13,333</td>
</tr>
<tr>
<td>February inflows</td>
<td>1,000,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March balance</td>
<td>$5,000,000×4%÷12= 16,667</td>
<td>12</td>
<td>16,667</td>
</tr>
<tr>
<td>March outflows</td>
<td>(5,000,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April balance</td>
<td>$0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>April outflows</td>
<td>(3,000,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May balance</td>
<td>$(3,000,000)×8%÷12= (20,000)</td>
<td>12</td>
<td>(20,000)</td>
</tr>
<tr>
<td>May outflows</td>
<td>(2,000,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June balance</td>
<td>$(5,000,000)×8%÷12= (33,333)</td>
<td>12</td>
<td>(33,333)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$(16,667)</td>
</tr>
</tbody>
</table>

The question asks approximately how much interest will be paid. The nearest answer is $16,000.

Answer (B) is incorrect because The amount of $53,000 is approximately the amount of gross interest paid in the 2 months (May and June) that the company will have to pay interest.

Answer (C) is incorrect because The amount of $76,000 fails to include the $2 million beginning cash balance in the calculation.

Answer (D) is incorrect because The amount of $195,000 assumes that each interest amount is paid for a full year instead of only 1 month.

Topka, Inc., needs to borrow $500,000 to meet its working capital requirements for next year. The Merchant Bank has offered the company a 9.5% simple interest loan that has a 16% compensating balance requirement. Determine the effective interest rate for the loan.

A. 11.02%
B. 11.31%
C. 12.75%
D. 19.00%

Answer (A) is incorrect because The effective interest rate is equal to the net interest expense over the usable funds. The amount of 11.02% incorrectly multiples the simple interest with the compensating balance requirement and then adds it to the simple interest in order to calculate the effective interest rate.

Answer (B) is correct. The effective interest rate is equal to the net interest expense over the usable funds. Topka’s net interest expense is equal to $47,500 ($500,000 × 9.5%). Because the bank is requiring a compensating balance of 16%, Topka’s usable funds are equal to $420,000 [$500,000 – ($500,000 × 16%)]. Thus, the effective interest rate is 11.31% ($47,500 ÷ $420,000).

Answer (C) is incorrect because The effective interest rate is equal to the net interest expense over the usable funds. The amount of 12.75% incorrectly averages the 9.5% simple interest and the 16% compensating balance requirement to calculate the effective interest rate.

Answer (D) is incorrect because The effective interest rate is equal to the net interest expense over the usable funds. The amount of 19.00% incorrectly uses the 16% compensating balance requirement to calculate the net interest expense in the numerator of the equation.
Which of the following economic functions is provided by the securities markets?

A. A marketplace in which inefficient and expensive investment transactions take place.
B. Unstable security prices because of frequent price changes.
C. A small number of transactions.
D. Facilitation of the issuance and purchase of new securities.

- Answer (A) is incorrect because Securities markets are a marketplace in which efficient and inexpensive transactions take place.
- Answer (B) is incorrect because Security prices are more stable due to smaller price changes.
- Answer (C) is incorrect because Securities markets continuously handle a large number of transactions.
- Answer (D) is correct. Securities markets facilitate investment by providing a marketplace for investors to conduct inexpensive transactions efficiently. Thus, investors are assured that they will have a place to buy and sell securities. Securities markets can handle continuous transactions that are based on the values and judgments of investors. Securities markets increase liquidity of securities by providing a marketplace. Thus, prices are relatively stable due to smaller price changes. Securities markets also facilitate the issuance and purchase of new securities.

Which of the following is not true about financial markets?

A. Financial markets are the total supply and demand for securities.
B. Financial markets facilitate borrowing and lending of financial assets and obligations.
C. In perfectly competitive markets, financial intermediaries act as price setters to clear the market.
D. Financial markets change over time, causing people to adjust their pattern of consumption.

- Answer (A) is incorrect because It is a true statement about financial markets.
- Answer (B) is incorrect because It is a true statement about financial markets.
- Answer (C) is correct. Financial markets bring entities that have funds to invest together with entities that have financing needs. They facilitate the transfer of assets and obligations. Due to this activity, financial markets cause people to adjust their consumption patterns. Financial intermediaries increase the efficiency of financial markets through better allocation of financial resources, not by clearing the market.
- Answer (D) is incorrect because It is a true statement about financial markets.

The financial markets that trade debt securities with maturities of less than 1 year and are dealer-driven are

A. Primary markets.
B. Capital markets.
C. Secondary markets.
D. Money markets.

- Answer (A) is incorrect because Primary markets raise capital for initial issues of securities.
- Answer (B) is incorrect because Capital markets trade long-term debt and equity securities.
- Answer (C) is incorrect because Secondary markets provide for trading previously issued securities.
Answer (D) is correct. Money markets trade debt securities with maturities of less than 1 year. These markets are dealer-driven because dealers are the principals who buy and sell instruments at their own risk. Money markets are marketable and short-term with low default risk. They can be found in New York, London, and Tokyo.

[808] Which of the following financial instruments can be traded in international money markets?

A. Mortgages.
B. Preferred stocks.
C. Government treasury bills.
D. Government treasury bonds.

- Answer (A) is incorrect because Mortgages are long-term, capital market securities.
- Answer (B) is incorrect because Preferred stocks are long-term, capital market securities.
- Answer (C) is correct. Funds are borrowed or lent for short periods (less than 1 year) in money markets. Examples of instruments traded in money markets are U.S. Treasury bills, bankers' acceptances, commercial paper, negotiable certificates of deposit, money market mutual funds, Eurodollar market time deposits, and consumer credit loans. Capital markets trade stocks and long-term debt.
- Answer (D) is incorrect because Treasury bonds are long-term, capital market securities.

[809] In capital markets, the primary market is concerned with the provision of new funds for capital investments through

A. New issues of bond and stock securities.
B. Exchanges of existing bond and stock securities.
C. The sale of forward or future commodities contracts.
D. New issues of bond and stock securities and exchanges of existing bond and stock securities.

- Answer (A) is correct. The primary market is the market for new stocks and bonds. In this market, wherein investment money flows directly to the issuer, securities are initially sold by investment bankers who purchase them from issuers and sell them through an underwriting group. Later transactions occur on securities exchanges or other markets.
- Answer (B) is incorrect because Existing securities are traded on a secondary market (e.g., securities exchanges).
- Answer (C) is incorrect because The futures market is where commodities contracts are sold, not the capital market.
- Answer (D) is incorrect because Exchanges of existing securities do not occur in the primary market.

[810] If a multinational firm were to raise equity capital on the London Stock Exchange, this would be referred to as a

A. Money market transaction.
B. Primary market transaction.
C. Secondary market transaction.
D. Mortgage market transaction.

- Answer (A) is incorrect because Money market transactions involve debt securities with maturities of less than 1 year.
- Answer (B) is correct. The primary market is one in which a firm raises additional long-term debt or equity capital. It is a market in which newly created securities are bought and sold for the first time.
- Answer (C) is incorrect because Secondary market transactions involve the trading of already outstanding securities by investors.
Answer (D) is incorrect because mortgage market transactions relate to loans on residential, commercial, industrial, and farm real estate.

The over-the-counter (OTC) market is:

A. An auction market where trading takes place at a particular physical site like the New York Stock Exchange.
B. A dealer market where brokers and dealers are linked by telecommunications equipment to trade securities.
C. An auction market that trades the majority of stocks.
D. A dealer market that trades securities on the stock exchanges due to the high dollar volume of trading.

- Answer (A) is incorrect because the OTC market is a dealer market that is connected by telecommunications equipment.
- Answer (B) is correct. The OTC market is a dealer market, in which brokers and dealers are linked by telecommunications equipment. Securities not traded on the stock exchanges are traded in the OTC market. The dollar volume of trading is much greater on the stock exchanges than the OTC market because the largest companies are usually listed on the stock exchanges. However, the majority of all stocks are traded in the OTC market.
- Answer (C) is incorrect because the OTC market is a dealer market that trades the majority of stocks.
- Answer (D) is incorrect because the OTC market does not trade securities traded on the stock exchanges.

The market for outstanding, listed common stock is called the

A. Primary market.
B. New issue market.
C. Over-the-counter market.
D. Secondary market.

- Answer (A) is incorrect because firms raise capital by issuing new securities in the primary market. The initial public offering market is a frequently used term for the market in which previously privately owned firms issue new securities to the public.
- Answer (B) is incorrect because stock that is already listed and outstanding is traded in the secondary market.
- Answer (C) is incorrect because the over-the-counter market is the network of dealers that provides for trading in unlisted securities.
- Answer (D) is correct. Previously issued (outstanding) stocks of publicly owned companies are traded among investors in the secondary market. The original issuer receives no additional capital as a result of such trades.

Which of the following is a financial intermediary?

A. Mutual funds.
B. Money markets.
C. The New York Stock Exchange.
D. The over-the-counter market.

- Answer (A) is correct. Financial intermediaries increase the efficiency of financial markets. A financial intermediary is a specialized firm that obtains funds from savers, issues its own securities, and uses the money to purchase a business’s securities. Accordingly, they create new forms of capital. Mutual funds are corporations that use funds from savers to invest in stocks, long-term bonds, or short-term debt.
● Answer (B) is incorrect because Money markets are the supply and demand of debt securities with maturities of less than 1 year.
● Answer (C) is incorrect because The New York Stock Exchange is a capital market that trades long-term debt and equity securities.
● Answer (D) is incorrect because The over-the-counter market is a secondary capital market that trades securities not traded on the stock exchanges.

[814] James Wills, the treasurer of a major multinational company, needs to borrow $50 million to finance new production facilities. Wills is deciding between direct financing or a public offering. All of the following statements in regard to these two alternatives are correct except that

A. The rating assigned by Standard & Poor’s or Moody’s is critical in pricing public debt.
B. Private debt is issued to sophisticated investors such as insurance companies.
C. Public debt tends to have higher interest rates because of its lower liquidity.
D. Public debt needs to be registered with the SEC, a time-consuming and costly process.

● Answer (A) is incorrect because The rating assigned by recognized rating services is critical in pricing public debt.
● Answer (B) is incorrect because A private offering is made only to sophisticated investors such as insurance companies.
● Answer (C) is correct. Public debt tends to have lower interest rates because of its higher liquidity.
● Answer (D) is incorrect because A public offering must be registered with the SEC, a time-consuming and costly process.

[815] Financial market efficiency implies that

A. All securities are perfect substitutes, and that the net present value of any securities investment is zero.
B. A firm’s share price may not be a good estimate of future cash flows because price adjustment to new information is slow.
C. It is possible to systematically gain or lose abnormal profits from trading on the basis of available public information.
D. Because of the speculative nature of securities markets, share prices may not be the best benchmark for corporate financial choices.

● Answer (A) is correct. The efficient markets hypothesis (EMH) states that current stock prices immediately and fully reflect all relevant information. Hence, the market is continuously adjusting to new information and acting to correct pricing errors. Thus, the price of a security, which reflects an assessment of future cash flows, must equal the present value of those flows (NPV = 0) if the security is accurately priced. Furthermore, if all securities are accurately priced, every security has an NPV of $0, and all securities are therefore perfect substitutes.
● Answer (B) is incorrect because Price adjustments are instantaneous under the EMH.
● Answer (C) is incorrect because Securities prices are always in equilibrium under the EMH, i.e., no abnormal profit with public information.
● Answer (D) is incorrect because The EMH states that securities prices are, rather than are not, the best benchmark of corporate financial decisions.
The strong form of the efficient markets hypothesis (EMH) states that current market prices of securities reflect:

A. All publicly available information.
B. All information whether it is public or private.
C. No relevant information.
D. Only information found in past price movements.

- Answer (A) is incorrect because the semistrong form of EMH states that only publicly available information is reflected in current market prices.
- Answer (B) is correct. The EMH states that stock prices reflect all relevant information, so the market is continuously adjusting to new information. Stock prices are in equilibrium, so investors cannot earn abnormal returns. The strong form of the EMH states that all public and private information is instantaneously reflected in current market prices of securities. Thus, investors cannot earn abnormal returns.
- Answer (C) is incorrect because the EMH states that current market prices reflect all information, including past price movements.
- Answer (D) is incorrect because the weak form of the EMH states that only past price movements are reflected in current market prices.

The semistrong form of the efficient markets hypothesis (EMH) states that current market prices of securities reflect:

A. No pertinent information.
B. All pertinent information.
C. Only information contained in past price movements.
D. Only publicly available information.

- Answer (A) is incorrect because the EMH states that current prices reflect at least the information contained in past price movements.
- Answer (B) is incorrect because the strong form of the EMH states that current market prices reflect all pertinent information, including insider information.
- Answer (C) is incorrect because the weak form of the EMH states that current market prices reflect only information contained in past price movements.
- Answer (D) is correct. According to the EMH, stock prices are in equilibrium and investors cannot obtain abnormal returns, that is, returns in excess of the riskiness of their investments. The semistrong form of the EMH postulates that current market prices reflect all publicly available information. However, investors with inside information can still earn an abnormal return.

The weak form of the efficient markets hypothesis (EMH) states that current market prices of securities reflect:

A. All past price movements.
B. All public information.
C. All public and private information.
D. No relevant information.

- Answer (A) is correct. The EMH states that stock prices fully reflect all relevant information, including public and private information. The securities prices are in equilibrium because they are always adjusting to new information. The weak form of the EMH states that only past price movements are reflected in current securities prices and no abnormal returns can be earned.
- Answer (B) is incorrect because the semistrong form of the EMH states that only public information is reflected in securities prices.
Answer (C) is incorrect because The strong form of the EMH states that all information, including public and private, is reflected in securities prices.
Answer (D) is incorrect because The EMH states that relevant information is reflected in securities prices from at least the past price movements.

Moody’s and Standard & Poor’s debt ratings depend on

A. The chances of default.
B. The size of the company.
C. The size and the type of issue.
D. The firm’s industry.

Answer (A) is correct. Debt ratings are based on the probability of default and the protection for investors in case of default.
Answer (B) is incorrect because The size of the company is relevant only insofar as it bears upon the probability of default.
Answer (C) is incorrect because The size and the type of issue are relevant only insofar as they bear upon the probability of default.
Answer (D) is incorrect because The firm’s industry is relevant only insofar as it bears upon the probability of default.

If a bond is rated below BBB, it is called

A. A zero-coupon bond.
B. An investment grade bond.
C. A junk bond.
D. An income bond.

Answer (A) is incorrect because A zero-coupon bond pays no interest and is sold at a discount.
Answer (B) is incorrect because An investment grade bond is rated A or BBB.
Answer (C) is correct. AAA and AA are Standard & Poor’s highest ratings. They signify the highest quality. Bonds rated A and BBB are investment grade. Bonds rated below BBB are speculative high-yield or low-grade bonds (junk bonds).
Answer (D) is incorrect because An income bond pays interest only if the issuer earns income sufficient to pay the interest.

Which one of the options below best describes a public offering where there is less price uncertainty due to the existence of a benchmark price?

A. Shelf registration.
B. A subsequent or secondary offering.
C. A red herring registration.
D. An initial public offering.

Answer (A) is incorrect because A shelf registration does not best describe a public offering where there is less price uncertainty due to the existence of a benchmark. Under a shelf registration, a master registration statement is filed for securities that the company reasonably expects to sell within 2 years. However, they are not put “on the shelf” until the most opportune time for offering is determined.
Answer (B) is correct. Later issues of stock by the same company are subsequent offerings. Secondary markets provide for the trading of previously issued securities. The sale of the stock in the primary market can be used as a benchmark because the same type of securities were already issued in this market.

Answer (C) is incorrect because A red herring does not best describe a public offering where there is less price uncertainty due to the existence of a benchmark. A red herring is a preliminary registration statement that must be filed with the SEC describing a new issue of stock and the prospects of the issuing company.

Answer (D) is incorrect because An initial public offering does not best describe a public offering where there is less price uncertainty due to the existence of a benchmark. An initial public offering is a firm’s first issuance of securities to the public. Thus, there is no benchmark.

[822] In practice, dividends

A. Usually exhibit greater stability than earnings.
B. Fluctuate more widely than earnings.
C. Tend to be a lower percentage of earnings for mature firms.
D. Are usually changed every year to reflect earnings changes.

Answer (A) is correct. Dividend policy determines the portion of net income distributed to stockholders. Corporations normally try to maintain a stable level of dividends, even though profits may fluctuate considerably, because many stockholders buy stock with the expectation of receiving a certain dividend every year. Thus, management tends not to raise dividends if the payout cannot be sustained. The desire for stability has led theorists to propound the information content or signaling hypothesis: A change in dividend policy is a signal to the market regarding management’s forecast of future earnings. This stability often results in a stock that sells at a higher market price because stockholders perceive less risk in receiving their dividends.

Answer (B) is incorrect because Most companies try to maintain stable dividends.

Answer (C) is incorrect because Mature firms have less need of earnings to reinvest for expansion; thus, they tend to pay a higher percentage of earnings as dividends.

Answer (D) is incorrect because Most companies try to maintain stable dividends.

[823] Residco, Inc., expects net income of $800,000 for the next fiscal year. Its targeted and current capital structure is 40% debt and 60% common equity. The director of capital budgeting has determined that the optimal capital spending for next year is $1.2 million. If Residco follows a strict residual dividend policy, what is the expected dividend-payout ratio for next year?

A. 90.0%
B. 66.7%
C. 40.0%
D. 10.0%

Answer (A) is incorrect because This percentage is the reinvestment ratio.

Answer (B) is incorrect because This percentage is the ratio between earnings and investment.

Answer (C) is incorrect because The percentage is the ratio of debt in the ideal capital structure.
Answer (D) is correct. Under the residual theory of dividends, the residual of earnings paid as dividends depends on the available investments and the debt-equity ratio at which cost of capital is minimized. The rational investor should prefer reinvestment of retained earnings when the return exceeds what the investor could earn on investments of equal risk. However, the firm may prefer to pay dividends when investment returns are poor and the internal equity financing would move the firm away from its ideal capital structure. If Residco wants to maintain its current structure, 60% of investments should be financed from equity. Hence, it needs $720,000 ($1,200,000 × 60%) of equity funds, leaving $80,000 of net income ($800,000 NI – $720,000) available for dividends. The dividend-payout ratio is therefore 10% ($80,000 ÷ $800,000 NI).

[Fact Pattern #77]
A firm’s dividend policy may treat dividends either as the residual part of a financing decision or as an active policy strategy.

[824] (Refers to Fact Pattern #77)
Treating dividends as the residual part of a financing decision assumes that

A. Earnings should be retained and reinvested as long as profitable projects are available.
B. Dividends are important to shareholders, and any earnings left over after paying dividends should be invested in high-return assets.
C. Dividend payments should be consistent.
D. Dividends are relevant to a financing decision.

● Answer (A) is correct. According to the residual theory of dividends, the amount (residual) of earnings paid as dividends depends on the available investment opportunities and the debt-equity ratio at which cost of capital is minimized. The rational investor should prefer reinvestment of retained earnings when the return exceeds what the investor could earn on investments of equal risk. However, the firm may prefer to pay dividends when investment opportunities are poor and the use of internal equity financing would move the firm away from its ideal capital structure.

● Answer (B) is incorrect because A residual theory assumes that investors want the company to reinvest earnings in worthwhile projects, not pay dividends.

● Answer (C) is incorrect because Dividend payments will not be consistent under a residual theory. The corporation will pay dividends only when internal investment options are unacceptable.

● Answer (D) is incorrect because Dividends would not be important to a financing decision under the residual theory.

[825] (Refers to Fact Pattern #77)
Treating dividends as an active policy strategy assumes that

A. Dividends provide information to the market.
B. The firm should pay dividends only after investing in all investment opportunities having an expected return greater than the cost of capital.
C. Dividends are irrelevant.
D. Dividends are costly, and the firm should retain earnings and issue stock dividends.

● Answer (A) is correct. Stock prices often move in the same direction as dividends. Moreover, companies dislike cutting dividends. They tend not to raise dividends unless anticipated future earnings will be sufficient to sustain the higher payout. Thus, some theorists have proposed the information content or signaling hypothesis. According to this view, a change in dividend policy is a signal to the market regarding management’s forecast of future earnings. Consequently, the relation of stock price changes to changes in dividends reflects not an investor preference for dividends over capital gains but rather the effect of the information conveyed.
Answer (B) is incorrect because the residual theory of dividends assumes that the firm should pay dividends only after investing in all investment opportunities having an expected return greater than the cost of capital.

Answer (C) is incorrect because an active dividend policy suggests management assumes that dividends are relevant to investors.

Answer (D) is incorrect because an active dividend policy recognizes that investors want dividends.

A stock dividend

A. Increases the debt-to-equity ratio of a firm.
B. Decreases future earnings per share.
C. Decreases the size of the firm.
D. Increases stockholders’ wealth.

Answer (A) is incorrect because a stock dividend has no effect except on the composition of the stockholders’ equity section of the balance sheet.

Answer (B) is correct. A stock dividend is a transfer of equity from retained earnings to paid-in capital. The debit is to retained earnings and the credits are to common stock and additional paid-in capital. Additional shares are outstanding following the stock dividend, but every stockholder maintains the same percentage of ownership. In effect, a stock dividend divides the pie (the corporation) into more pieces, but the pie is still the same size. Hence, a corporation will have a lower EPS and a lower book value per share following a stock dividend, but every stockholder will be just as well off as previously. A stock dividend has no effect except on the composition of the stockholders’ equity section of the balance sheet.

Answer (C) is incorrect because a stock dividend has no effect except on the composition of the stockholders’ equity section of the balance sheet.

Answer (D) is incorrect because a stock dividend has no effect except on the composition of the stockholders’ equity section of the balance sheet.

Brady Corporation has 6,000 shares of 5% cumulative, $100 par value preferred stock outstanding and 200,000 shares of common stock outstanding. Brady’s board of directors last declared dividends for the year ended May 31, Year 1, and there were no dividends in arrears. For the year ended May 31, Year 3, Brady had net income of $1,750,000. The board of directors is declaring a dividend for common shareholders equivalent to 20% of net income. The total amount of dividends to be paid by Brady at May 31, Year 3, is

A. $350,000
B. $380,000
C. $206,000
D. $410,000

Answer (A) is incorrect because the amount of $350,000 is the common stock dividend.

Answer (B) is incorrect because the amount of $380,000 omits the $30,000 of cumulative dividends for the year ended May 31, Year 2.

Answer (C) is incorrect because the amount of $206,000 is based on a flat rate of $1 per share of stock.

Answer (D) is correct. If a company has cumulative preferred stock, all preferred dividends for the current and any unpaid prior years must be paid before any dividends can be paid on common stock. The total preferred dividends that must be paid equal $60,000 (6,000 shares × $100 par × 5% × 2 years), and the common dividend is $350,000 ($1,750,000 × 20%), for a total of $410,000.
A 10% stock dividend most likely

A. Increases the size of the firm.
B. Increases shareholders’ wealth.
C. Decreases future earnings per share.
D. Decreases net income.

- Answer (A) is incorrect because a stock dividend has no effect except on the composition of the shareholders’ equity section of the balance sheet.
- Answer (B) is incorrect because a stock dividend has no effect except on the composition of the shareholders’ equity section of the balance sheet.
- Answer (C) is correct. A stock dividend is a transfer of equity from retained earnings to paid-in capital. The debit is to retained earnings, and the credits are to common stock and additional paid-in capital. Additional shares are outstanding following the stock dividend, but every shareholder maintains the same percentage of ownership. In effect, a stock dividend divides the pie (the corporation) into more pieces, but the pie is still the same size. Hence, a corporation will have a lower EPS and a lower book value per share following a stock dividend, but every shareholder will be just as well off as previously. A stock dividend has no effect except on the composition of the shareholders’ equity section of the balance sheet.
- Answer (D) is incorrect because a stock dividend has no effect except on the composition of the shareholders’ equity section of the balance sheet.

When a company desires to increase the market value per share of common stock, the company will implement

A. The sale of treasury stock.
B. A reverse stock split.
C. The sale of preferred stock.
D. A stock split.

- Answer (A) is incorrect because a sale of treasury stock increases the supply of shares and could lead to a decline in market price.
- Answer (B) is correct. A reverse stock split decreases the number of shares outstanding, thereby increasing the market price per share. A reverse stock split may be desirable when a stock is selling at such a low price that management is concerned that investors will avoid the stock because it has an undesirable image.
- Answer (C) is incorrect because a sale of preferred stock will take dollars out of investors’ hands, thereby reducing funds available to invest in common stock; therefore, market price per share of common stock will not increase.
- Answer (D) is incorrect because a stock split increases the shares issued and outstanding. The market price per share is likely to decline as a result.

Arch, Inc., has 200,000 shares of common stock outstanding. Net income for the recently ended fiscal year was $500,000, and the stock has a price-earnings ratio of eight. The board of directors has just declared a three-for-two stock split. For an investor who owns 100 shares of stock before the split, the approximate value (rounded to the nearest dollar) of the investment in Arch stock immediately after the split is

A. $250
B. $1,333
C. $2,000
D. $3,000

- Answer (A) is incorrect because the amount of $250 represents the annual earnings on 100 shares.
Answer (B) is incorrect because The amount of $1,333 assumes that the value of the total investment declines after the split.

Answer (C) is correct. EPS equals $2.50 ($500,000 NI ÷ 200,000 pre-split shares). Thus, 100 shares had a value of $2,000 (100 shares × $2.50 EPS × 8 P/E ratio) before the split. This value is unchanged by the stock split. Although the stockholder has more shares, the total value of the investment is the same.

Answer (D) is incorrect because The amount of $3,000 assumes that the value of the investment as well as the number of shares increases by 50%.

[831] On August 15, National Corporation announced a 1-for-10 reverse split, the event to occur on September 6, subject to shareholder approval. The stock’s closing price on August 14 was $1.375. If nothing changes, at what price would you expect the stock to sell after the stock split is made effective on September 6?

A. $13.75
B. $10.00
C. $2.75
D. $1.38

Answer (A) is correct. A reverse stock split, like a regular stock split, does not change the corporation’s market capitalization. Thus, if there are 1/10 as many shares outstanding as previously, they should be worth 10 times as much. Thus, the price after the reverse split would be $13.75 (10 × $1.375).

Answer (B) is incorrect because The shares should be worth 10 times as much as before the split.

Answer (C) is incorrect because The shares should be worth 10 times as much as before the split.

Answer (D) is incorrect because The shares should be worth 10 times as much as before the split.

[832] XYZ Corp. has 1,000 shares outstanding and retained earnings of $25,000. Theoretically, what would you expect to happen to the price of XYZ stock, currently selling for $50 per share, if a 20% stock dividend is declared?

A. Price should increase to $60 per share.
B. Price should decrease to $40 per share.
C. Price should decrease to $41.67 per share.
D. Nothing; price should remain at $50.

Answer (A) is incorrect because Share price should fall since the corporate pie is being divided into more pieces.

Answer (B) is incorrect because This would mean a drop in market capitalization.

Answer (C) is correct. The total market capitalization of 1,000 shares is $50,000. That should remain about the same following the issuance of the 200 shares of stock dividend. Thus, dividing $50,000 by 1,200 shares equals $41.67 per share.

Answer (D) is incorrect because The price per share should drop since each shareholder will now have more shares representing the same total ownership.

[833] If a company uses the residual dividend policy, it will pay

A. A fixed cash dividend each quarter and use the residual as retained earnings.
B. A fixed stock dividend each quarter and retain all earnings as a residual.
C. All earnings as dividends each year.
D. Dividends only if earnings exceed the amount needed to support an optimal capital budget.
[834] Stock dividends and stock splits differ in that

A. Stock splits involve a bookkeeping transfer from retained earnings to the capital stock account.
B. Stock splits are paid in additional shares of common stock, whereas a stock dividend results in replacement of all outstanding shares with a new issue of shares.
C. In a stock split, a larger number of new shares replaces the outstanding shares.
D. A stock dividend results in a decline in the par value per share.

- Answer (A) is incorrect because Stock dividends involve a bookkeeping transfer. Stock splits do not involve a change in the capital accounts.
- Answer (B) is incorrect because Stock dividends are paid in additional shares of common stock. In stock splits, all outstanding shares are replaced with a new issue of shares.
- Answer (C) is correct. A stock split does not involve any accounting entries. Instead, a larger number of new shares are issued to replace and retire all outstanding shares.
- Answer (D) is incorrect because In a stock split, there is a large decline in the book value and in the market value per share. A stock dividend does not affect the par value of stock.

[835] If the capital gains were taxed at a lower rate than regular dividend income, then the <List A> the dividend payout percentage of a company, the <List B>, everything else equal.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
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<tbody>
<tr>
<td>A. Higher</td>
<td>Higher its stock price would be</td>
</tr>
<tr>
<td>B. Higher</td>
<td>Lower its book value of equity would be</td>
</tr>
<tr>
<td>C. Lower</td>
<td>Lower its cost of equity would be</td>
</tr>
<tr>
<td>D. Lower</td>
<td>Lower its stock price would be</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because A higher dividend payout ratio is associated with a lower stock price when the tax environment favors capital gains over dividends. The reason is that the after-tax return to investors is lower for dividend payments than for capital gains (share price appreciation).
- Answer (B) is incorrect because There is no relationship between the book value of equity and the relative taxation of dividends and capital gains.
- Answer (C) is correct. Lower dividend payout ratios will be favored by investors if dividends are taxed at a higher rate than capital gains. The cost of equity for the company will be lower under the lower dividend payout policy because more retained earnings will be available for reinvestment.
- Answer (D) is incorrect because A lower dividend payout ratio is associated with a higher, not a lower, stock price when the tax environment favors dividends over capital gains.
On December 1, Charles Company’s board of directors declared a cash dividend of $1.00 per share on the 50,000 shares of common stock outstanding. The company also has 5,000 shares of treasury stock. Shareholders of record on December 15 are eligible for the dividend, which is to be paid on January 1. On December 1, the company should

A. Make no accounting entry.  
B. Debit retained earnings for $50,000.  
C. Debit retained earnings for $55,000.  
D. Debit retained earnings for $50,000 and paid-in capital for $5,000.

- Answer (A) is incorrect because a liability should be recorded.  
- Answer (B) is correct. Dividends are recorded on their declaration date by a debit to retained earnings and a credit to dividends payable. The dividend is the amount payable to all shares outstanding. Treasury stock is not eligible for dividends because it is not outstanding. Thus, the December 1 entry is to debit retained earnings and credit dividends payable for $50,000 (50,000 × $1).  
- Answer (C) is incorrect because the treasury stock is not eligible for a dividend.  
- Answer (D) is incorrect because paid-in capital is not affected by the declaration of a dividend.

A company following a residual dividend payout policy will pay higher dividends when, everything else equal, it has

A. Less-attractive investment opportunities.  
B. Lower earnings available for reinvestment.  
C. A lower targeted debt-to-equity ratio.  
D. A lower opportunity cost of retained earnings.

- Answer (A) is correct. Under the residual theory of dividends, the firm prefers to pay dividends when investment opportunities are poor and internal financing would move the firm away from its ideal capital structure. Thus, a company with less-attractive investment opportunities will have a lower optimal capital budget. Under a residual dividend policy, a lower optimal capital budget will result in a higher dividend payout ratio, other factors being constant.  
- Answer (B) is incorrect because when lower earnings are available for reinvestment, any level of capital expenditures will require, other factors being constant, a greater proportion of available internal funds. The dividend payout ratio will then be lower, not higher, under a residual payout policy.  
- Answer (C) is incorrect because the lower the debt-to-equity ratio, the higher the proportion of new investments financed with equity. Under a residual dividend payout policy, the result will be a lower, not a higher, dividend payout as more internally available funds are retained for reinvestment.  
- Answer (D) is incorrect because the lower the opportunity cost of funds, the lower the discount rate used to evaluate capital projects and the more attractive the investment opportunities. Under a residual payout policy, more internally generated funds will be required to finance the optimal capital budget, and the dividend payout will be lower, not higher.

The date when the right to a dividend expires is called the

A. Declaration date.  
B. Ex-dividend date.  
C. Holder-of-record date.  
D. Payment date.

- Answer (A) is incorrect because on the declaration date, the directors formally vote to declare a dividend.
Answer (B) is correct. The ex-dividend date is 4 days before the date of record. Unlike the other relevant dates, it is not established by the corporate board of directors but by the stock exchanges. The period between the ex-dividend date and the date of record gives the stock exchange members time to process any transactions in time for the new shareholders to receive the dividend to which they are entitled. An investor who buys a share of stock before the ex-dividend date will receive the dividend that has been previously declared. An investor who buys after the ex-dividend date (but before the date of record or payment date) will not receive the declared dividend.

Answer (C) is incorrect because On the date of record, the corporation determines which shareholders will receive the declared dividend.

Answer (D) is incorrect because On the date of payment, the dividend is actually paid.

[839] The policy decision that by itself is least likely to affect the value of the firm is the

A. Investment in a project with a large net present value.
B. Sale of a risky division that will now increase the credit rating of the entire company.
C. Distribution of stock dividends to shareholders.
D. Use of a more highly leveraged capital structure that resulted in a lower cost of capital.

Answer (A) is incorrect because A positive NPV project should increase the value of the firm.

Answer (B) is incorrect because The higher credit rating should reduce the cost of capital and therefore increase the value of the firm.

Answer (C) is correct. A stock dividend does not significantly affect the value of the firm. It simply divides ownership interests into smaller pieces without changing any shareholder’s proportionate share of ownership.

Answer (D) is incorrect because The lower cost of capital should reduce the required rate of return and increase the value of the firm.

[840] Which of the following types of dividends do not reduce equity in the corporation?

A. Cash dividends.
B. Property dividends.
C. Liquidating dividends.
D. Stock dividends and split-ups in the form of a dividend.

Answer (A) is incorrect because Cash dividends reduce equity. They involve an immediate or promised future nonreciprocal distribution of assets.

Answer (B) is incorrect because Property dividends reduce equity. They involve an immediate or promised future nonreciprocal distribution of assets.

Answer (C) is incorrect because Liquidating dividends reduce equity. They involve an immediate or promised future nonreciprocal distribution of assets.

Answer (D) is correct. The issuance of a stock dividend results in a debit to retained earnings and credits to contributed capital for the fair value of the stock. A split-up effected in the form of a dividend requires capitalization of retained earnings equal to the amount established by the issuer’s state of incorporation (usually par value). Consequently, neither a stock dividend nor a split-up effected in the form of a dividend has a net effect on equity.
A company has 1,000 shares of $10 par value common stock and $5,000 of retained earnings. Two proposals are under consideration. The first is a stock split giving each shareholder two new shares for each share formerly held. The second is to declare and distribute a 50% split-up effected in the form of a dividend.

The stock split proposal will <List A> earnings per share by <List B> than will the proposal for a split-up effected in the form of a dividend.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Increase</td>
<td>More</td>
</tr>
<tr>
<td>B. Increase</td>
<td>Less</td>
</tr>
<tr>
<td>C. Decrease</td>
<td>More</td>
</tr>
<tr>
<td>D. Decrease</td>
<td>Less</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because The stock split results in a greater number of shares outstanding and a lower EPS.
- Answer (B) is incorrect because The stock split results in a greater number of shares outstanding and a lower EPS.
- Answer (C) is correct. The stock split will double the number of shares outstanding to 2,000. The 50% split-up effected in the form of a dividend will increase the number of outstanding shares to 1,500. The higher number of shares in the stock split will result in a lower earnings per share than will result from the split-up effected in the form of a dividend.
- Answer (D) is incorrect because The stock split results in a greater number of shares outstanding and a lower EPS.

Under the <List A>, the par value per outstanding share will <List B>.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Split-up effected in the form of a dividend</td>
<td>Increase</td>
</tr>
<tr>
<td>B. Stock split</td>
<td>Increase</td>
</tr>
<tr>
<td>C. Split-up effected in the form of a dividend</td>
<td>Decrease</td>
</tr>
<tr>
<td>D. Stock split</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Par value per share does not change following a split-up effected in the form of a dividend.
- Answer (B) is incorrect because Par value per share decreases following a stock split.
- Answer (C) is incorrect because Par value per share does not change following a split-up effected in the form of a dividend.
- Answer (D) is correct. A stock split results in a lower par value per share because the total number of shares increases but the total par value of outstanding stock does not change.
A company declares and pays both a $200,000 cash dividend and a 10% stock dividend. The effect of the cash dividend is to 

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Cash</td>
<td>Increase retained earnings</td>
</tr>
<tr>
<td>B. Cash</td>
<td>Decrease retained earnings and increase equity</td>
</tr>
<tr>
<td>C. Stock</td>
<td>Decrease retained earnings</td>
</tr>
<tr>
<td>D. Stock</td>
<td>Decrease retained earnings and decrease equity</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Cash dividends reduce retained earnings.
- Answer (B) is incorrect because Cash dividends decrease both retained earnings and equity.
- Answer (C) is correct. A stock dividend results in a transfer from retained earnings to paid-in capital equal to the fair value of the stock.
- Answer (D) is incorrect because Stock dividends have no net effect on equity.

The purchase of treasury stock with a firm’s surplus cash

| Answer (A) is incorrect because Assets decrease when treasury stock is purchased. |
| Answer (B) is correct. A purchase of treasury stock involves a decrease in assets (usually cash) and a corresponding decrease in equity. Thus, equity is reduced and the debt-to-equity ratio and financial leverage increase. |
| Answer (C) is incorrect because A firm’s interest coverage ratio is unaffected. Earnings, interest expense, and taxes will all be the same regardless of the transaction. |
| Answer (D) is incorrect because The purchase of treasury stock is antidilutive; the same earnings will be spread over fewer shares. Some firms purchase treasury stock for this reason. |
Jensen Corporation’s board of directors met on June 3 and declared a regular quarterly cash dividend of $.40 per share for a total value of $200,000. The dividend is payable on June 24 to all stockholders of record as of June 17. Excerpts from the statement of financial position for Jensen Corporation as of May 31 are presented as follows.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$400,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>800,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>1,200,000</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$2,400,000</strong></td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$1,000,000</strong></td>
</tr>
</tbody>
</table>

Assume that the only transactions to affect Jensen Corporation during June are the dividend transactions.

[845] (Refers to Fact Pattern #79)
Jensen’s total stockholders’ equity would be

A. Unchanged by the dividend declaration and decreased by the dividend payment.
B. Decreased by the dividend declaration and increased by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Decreased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is incorrect because a dividend declaration reduces retained earnings and total stockholders’ equity. The subsequent payment will have no effect on stockholders’ equity because only cash and dividends payable are reduced.
- Answer (B) is incorrect because a dividend declaration reduces retained earnings and total stockholders’ equity. The subsequent payment will have no effect on stockholders’ equity because only cash and dividends payable are reduced.
- Answer (C) is incorrect because a dividend declaration reduces retained earnings and total stockholders’ equity. The subsequent payment will have no effect on stockholders’ equity because only cash and dividends payable are reduced.
- Answer (D) is correct. A dividend declaration reduces retained earnings and thus total stockholders’ equity. The subsequent payment will have no effect on stockholders’ equity since only cash and dividends payable are reduced.

[846] (Refers to Fact Pattern #79)
If the dividend declared by Jensen Corporation had been a 10% stock dividend instead of a cash dividend, Jensen’s current liabilities would have been

A. Unchanged by the dividend declaration and increased by the dividend distribution.
B. Unchanged by the dividend declaration and decreased by the dividend distribution.
C. Increased by the dividend declaration and unchanged by the dividend distribution.
D. Unchanged by either the dividend declaration or the dividend distribution.

- Answer (A) is incorrect because a stock dividend requires transfer of an amount from retained earnings to paid-in capital. Consequently, no liability accounts are affected by either the declaration or the distribution of a stock dividend.
- Answer (B) is incorrect because a stock dividend requires transfer of an amount from retained earnings to paid-in capital. Consequently, no liability accounts are affected by either the declaration or the distribution of a stock dividend.
- Answer (C) is incorrect because a stock dividend requires transfer of an amount from retained earnings to paid-in capital. Consequently, no liability accounts are affected by either the declaration or the distribution of a stock dividend.
Answer (D) is correct. A stock dividend requires transfer of an amount from retained earnings to paid-in capital. Consequently, no liability accounts are affected by either the declaration or the distribution of a stock dividend.

[Fact Pattern #80]
Excerpts from the statement of financial position for Landau Corporation as of September 30 of the current year are presented as follows.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$950,000</td>
</tr>
<tr>
<td>Accounts receivable (net)</td>
<td>1,675,000</td>
</tr>
<tr>
<td>Inventories</td>
<td>2,806,000</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>$5,431,000</strong></td>
</tr>
<tr>
<td>Accounts payable</td>
<td>$1,004,000</td>
</tr>
<tr>
<td>Accrued liabilities</td>
<td>785,000</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>$1,789,000</strong></td>
</tr>
</tbody>
</table>

The board of directors of Landau Corporation met on October 4 of the current year and declared the regular quarterly cash dividend amounting to $750,000 ($0.60 per share). The dividend is payable on October 25 of the current year to all shareholders of record as of October 12 of the current year. Assume that the only transactions to affect Landau Corporation during October of the current year are the dividend transactions and that the closing entries have been made.

[847] (Refers to Fact Pattern #80)
Landau Corporation’s total equity was

A. Unchanged by the dividend declaration and decreased by the dividend payment.
B. Decreased by the dividend declaration and increased by the dividend payment.
C. Unchanged by either the dividend declaration or the dividend payment.
D. Decreased by the dividend declaration and unchanged by the dividend payment.

- Answer (A) is incorrect because The declaration of a cash dividend reduces equity.
- Answer (B) is incorrect because The payment of a cash dividend decreases assets and liabilities, but has no effect on equity.
- Answer (C) is incorrect because The declaration of a cash dividend reduces equity.
- Answer (D) is correct. A dividend declaration decreases equity, of which retained earnings is a component, by the amount of the dividend. Because equity equals assets minus liabilities, the subsequent payment of the dividend had no effect on equity because an asset and a liability were decreased by the same amount.

[848] (Refers to Fact Pattern #80)
If the dividend declared by Landau Corporation had been a 10% stock dividend instead of a cash dividend, Landau’s current liabilities would have been

A. Unchanged by the dividend declaration and increased by the dividend distribution.
B. Unchanged by the dividend declaration and decreased by the dividend distribution.
C. Increased by the dividend declaration and unchanged by the dividend distribution.
D. Unchanged by either the dividend declaration or the dividend distribution.

- Answer (A) is incorrect because Neither the declaration nor the distribution of a stock dividend has an effect on current liabilities.
● Answer (B) is incorrect because Neither the declaration nor the distribution of a stock dividend has an effect on current liabilities.
● Answer (C) is incorrect because Neither the declaration nor the distribution of a stock dividend has an effect on current liabilities.
● Answer (D) is correct. A stock dividend (one less than 20% to 25% of the shares outstanding) requires a debit to one equity account (retained earnings) and a credit to one or more other equity accounts (common stock dividend distributable and paid-in capital in excess of par) for the fair value of the stock. The subsequent distribution of that stock dividend involves a debit to common stock dividend distributable and a credit to common stock, both of which are equity accounts. Thus, liabilities are unaffected by either the declaration or distribution of a stock dividend.

[849] (Refers to Fact Pattern #80)
If the dividend declared by Landau had been a 10% stock dividend instead of a cash dividend, Landau’s total stockholders’ equity would have been

A. Decreased by the dividend declaration and increased by the dividend distribution. 
B. Unchanged by the dividend declaration and increased by the dividend distribution. 
C. Increased by the dividend declaration and unchanged by the dividend distribution. 
D. Unchanged by either the dividend declaration or the dividend distribution.

● Answer (A) is incorrect because Neither the distribution nor the declaration of a stock dividend has an effect on total stockholders’ equity.
● Answer (B) is incorrect because The distribution of a stock dividend has no effect on total stockholders’ equity.
● Answer (C) is incorrect because The declaration of a stock dividend has no effect on total stockholders’ equity.
● Answer (D) is correct. The entry to record the declaration of a small stock dividend (one less than 20% to 25% of the shares outstanding) involves a debit to one stockholders’ equity account (retained earnings) and a credit to one or more other stockholders’ equity accounts (common stock dividend distributable and paid-in capital in excess of par) for the fair value of the stock. Consequently, the declaration has no effect on total stockholders’ equity because the entry merely entails a transfer from retained earnings to permanent capital. The subsequent distribution of a stock dividend requires only a debit to common stock dividend distributable and a credit to common stock. Because both are stockholders’ equity accounts, the distribution has no effect on total stockholders’ equity.

[850] Which one of the following best describes the record date as it pertains to common stock?

A. Four business days prior to the payment of a dividend. 
C. The date that is chosen to determine the ownership of shares. 
D. The date on which a prospectus is declared effective by the Securities and Exchange Commission.

● Answer (A) is incorrect because Four business days prior to the payment of a dividend is not a significant date; at one time, 4 days before the record date was called the ex-dividend date for stock-exchange-listed companies. That period is now 2 days.
● Answer (B) is incorrect because The 52-week high for a stock is not relevant to the distribution of dividends. 
● Answer (C) is correct. Three dates are important in the declaration and distribution of dividends: the date of declaration, the date of record, and the date of distribution. The date of record is the date as of which the corporation determines the shareholders who will receive the declared dividend. Essentially, the corporation closes its shareholder records on this date. Only those shareholders who own the stock on the date of record will receive the dividend. 
● Answer (D) is incorrect because The SEC’s treatment of a prospectus filing is not relevant to the distribution of dividends.
James Hemming, the chief financial officer of a midwestern machine parts manufacturer, is considering splitting the company’s stock, which is currently selling at $80 per share. The stock currently pays a $1 per share dividend. If the split is two-for-one, Mr. Hemming may expect the post-split price to be

A. Exactly $40, regardless of dividend policy.
B. Greater than $40, if the dividend is changed to $0.45 per new share.
C. Greater than $40, if the dividend is changed to $0.55 per new share.
D. Less than $40, regardless of dividend policy.

- Answer (A) is incorrect because the new price may be slightly higher because there might be greater demand for a $40 stock than for an $80 stock because more investors can afford a cheaper stock than a higher-priced stock.
- Answer (B) is incorrect because the lower total dividend would lower the overall stock price.
- Answer (C) is correct. If the pre-stock dividend payout rate were maintained, the post-split dividend would be $0.50 per share ($1 ÷ 2). Thus, if the dividend post-split is raised to $0.55, investors will bid up the price of the stock from its immediate post-split price of $40 per share ($80 ÷ 2).
- Answer (D) is incorrect because a lower dividend will lead to a lower stock price and vice versa.

The residual theory of dividends argues that dividends

A. Are necessary to maintain the market price of the common stock.
B. Are irrelevant.
C. Can be forgone unless there is an excess demand for cash dividends.
D. Can be paid if there is income remaining after funding all attractive investment opportunities.

- Answer (A) is incorrect because the residual theory of dividends does not hold that dividends are necessary to maintain the price of the stock.
- Answer (B) is incorrect because the residual theory of dividends does not hold that dividends are irrelevant.
- Answer (C) is incorrect because the residual theory of dividends does not hold that dividends can be forgone unless there is an excess demand for cash dividends.
- Answer (D) is correct. The residual theory of dividends holds that the amount (residual) of earnings paid as dividends depends on the available investment opportunities and the debt-equity ratio at which cost of capital is minimized. The rational investor should prefer reinvestment of retained earnings when the return exceeds what the investor could earn on investments of equal risk. However, the firm may prefer to pay dividends when investment opportunities are poor and the use of internal equity financing would move the firm away from its ideal capital structure.
Mason, Inc., is considering four alternative opportunities. Required investment outlays and expected rates of return for these investments are given below.

<table>
<thead>
<tr>
<th>Project</th>
<th>Investment Cost</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$200,000</td>
<td>12.5</td>
</tr>
<tr>
<td>B</td>
<td>$350,000</td>
<td>14.2</td>
</tr>
<tr>
<td>C</td>
<td>$570,000</td>
<td>16.5</td>
</tr>
<tr>
<td>D</td>
<td>$390,000</td>
<td>10.6</td>
</tr>
</tbody>
</table>

The investments will be financed through 40% debt and 60% common equity. Internally generated funds totaling $1,000,000 are available for reinvestment. If the cost of capital is 11%, and Mason strictly follows the residual dividend policy, how much in dividends would the company likely pay?

A. $120,000  
B. $328,000  
C. $430,000  
D. $650,000

Answer (A) is incorrect because this amount is the excess of cost ($1,120,000) over the $1,000,000 of retained earnings available.  
Answer (B) is correct. If the cost of capital is 11%, the company will invest in the three projects that have expected returns greater than 11%, which would cost $1,120,000 ($200,000 + $350,000 + $570,000). If 60% of that cost is paid with equity capital, it would require $672,000 of retained earnings ($1,120,000 × 60%). Subtracting the $672,000 of needed funds from the $1,000,000 available leaves $328,000 for dividends.  
Answer (C) is incorrect because this is the amount that would be left over if only the highest yielding investment (Project C) was purchased entirely from equity funds.  
Answer (D) is incorrect because this is the amount left if the $1,000,000 of available equity was matched with $400,000 (40%) of debt capital, which is incorrect.

When determining the amount of dividends to be declared, the most important factor to consider is the

A. Expectations of the shareholders.  
B. Future planned uses of retained earnings.  
C. Impact of inflation on replacement costs.  
D. Future planned uses of cash.

Answer (A) is incorrect because shareholder expectations should not affect a decision concerning the amount of dividends to be declared. Alternatively, investors may select investments that have traditionally matched their expectations, but this is not a decision facing corporate directors.  
Answer (B) is incorrect because retained earnings is an accrual-basis amount; dividends are paid in cash.  
Answer (C) is incorrect because the impact of inflation of replacement costs does not affect a decision concerning the amount of dividends to be declared.  
Answer (D) is correct. When determining the amount of dividends to be declared, the most important factor to consider is the future planned uses of cash. If the monies that would have been paid out in the form of excess dividends could provide the equity holders a higher return if employed in some productive capacity, a rational investor should not expect the excess payout.
Kalamazoo, Inc., has issued 25,000 shares of its authorized 50,000 shares of common stock. There are 5,000 shares of common stock that have been repurchased and are classified as treasury stock. Kalamazoo has 10,000 shares of preferred stock. If a $0.60 per share dividend has been authorized on its common stock, what will be the total common stock dividend payment?

A. $12,000  
B. $15,000  
C. $21,000  
D. $30,000

Answer (A) is correct. Declared dividends are only paid on the outstanding shares of the class of stock to which they apply. Thus, the treasury stock and the preferred stock are not included in the dividend calculation. The total common stock dividend payment is 

\[ \text{Total dividend} = (25,000 \text{ shares issued} - 5,000 \text{ shares repurchased}) \times \$0.60 \text{ per share} = \$12,000 \]

Answer (B) is incorrect because this amount results from using the total shares issued rather than the shares outstanding.  
Answer (C) is incorrect because this amount results from failing to subtract the shares repurchased and from improperly including preferred stock.  
Answer (D) is incorrect because this amount results from using the total shares authorized rather than the shares issued and outstanding.

A business combination may be legally structured as a merger, a consolidation, or an acquisition. Which of the following describes a business combination that is legally structured as a merger?

A. The surviving company is one of the two combining companies.  
B. The surviving company is neither of the two combining companies.  
C. An investor-investee relationship is established.  
D. A parent subsidary relationship is established.

Answer (A) is correct. In a business combination legally structured as a merger, the assets and liabilities of one of the combining companies are transferred to the books of the other combining company (the surviving company). The surviving company continues to exist as a separate legal entity. The nonsurviving company ceases to exist as a separate entity. Its stock is canceled, and its books are closed.  
Answer (B) is incorrect because it describes a consolidation in which a new firm is formed to account for the assets and liabilities of the combining companies.  
Answer (C) is incorrect because it describes an acquisition. A parent subsidary relationship exists when the investor holds more than 50% of the outstanding stock of the investee.  
Answer (D) is incorrect because it describes an acquisition. A parent subsidary relationship exists when the investor holds more than 50% of the outstanding stock of the investee.

A horizontal merger is a merger between

A. Two or more firms from different and unrelated markets.  
B. Two or more firms at different stages of the production process.  
C. A producer and its supplier.  
D. Two or more firms in the same market.

Answer (A) is incorrect because a merger between firms in different and unrelated markets is a conglomerate merger.
Answer (B) is incorrect because a merger between two or more firms at different stages of the production process is a vertical merger.
Answer (C) is incorrect because a merger between a producer and a supplier is a vertical merger.
Answer (D) is correct. A horizontal merger is one between competitors in the same market. From the viewpoint of the Justice Department, it is the most closely scrutinized type of merger because it has the greatest tendency to reduce competition.

[858] Which type of acquisition does not require shareholders to have a formal vote to approve?

A. Merger.
B. Acquisition of stock.
C. Acquisition of all of the firm’s assets.
D. Consolidation.

Answer (A) is incorrect because a merger is not an acquisition. In a merger, only one of the combining companies survives.
Answer (B) is correct. Purchasing the stock of another company is advantageous when management and the board of directors of the purchased company are hostile to the combination because the acquisition does not require a formal vote by the shareholders. Thus, the management and the board of directors cannot influence shareholders. Also, after the acquisition, both companies continue to operate separately.
Answer (C) is incorrect because an acquisition of all of the firm’s assets requires a vote from the shareholders.
Answer (D) is incorrect because a consolidation is different from an acquisition since, in a consolidation, a new company is formed and neither of the merging companies survives.

[859] The acquisition of a retail shoe store by a shoe manufacturer is an example of

A. Vertical integration.
B. A conglomerate.
C. Market extension.
D. Horizontal integration.

Answer (A) is correct. The acquisition of a shoe retailer by a shoe manufacturer is an example of vertical integration. Vertical integration is typified by a merger or acquisition involving companies that are in the same industry but at different levels in the supply chain. In other words, one of the companies supplies inputs for the other.
Answer (B) is incorrect because a conglomerate is a company made up of subsidiaries in unrelated industries.
Answer (C) is incorrect because market extension involves expanding into new market areas.
Answer (D) is incorrect because horizontal integration involves a merger between competing firms in the same industry.

[860] Which of the following is a combination involving the absorption of one firm by another?

A. Merger.
B. Consolidation.
C. Proxy fight.
D. Acquisition.
Answer (A) is correct. A merger is a business combination in which an acquiring firm absorbs another firm. The acquiring firm remains in business as a combination of the two merged firms. Thus, the acquiring firm maintains its name and identity. However, approval of the merger is required by votes of the shareholders of each firm.

Answer (B) is incorrect because a consolidation merges two companies and forms a new company in which neither of the two merging firms survives. It is similar to a merger, but one firm is not absorbed by another.

Answer (C) is incorrect because a proxy fight is an attempt by dissident shareholders to gain control of the corporation by electing directors.

Answer (D) is incorrect because both companies continue to operate separately after an acquisition.

When firm B merges with firm C to create firm BC, what has occurred?

A. A tender offer.
B. An acquisition of assets.
C. An acquisition of stock.
D. A consolidation.

Answer (A) is incorrect because a tender offer is used in an acquisition by a firm to the shareholders of another firm to tender their shares for a specified price.

Answer (B) is incorrect because in an acquisition of assets, both companies continue to operate separately.

Answer (C) is incorrect because in an acquisition of assets or stock, both companies continue to operate separately.

Answer (D) is correct. A consolidation is a business transaction in which a new company is organized to take over the combining companies. An entirely new company is formed, and neither of the merging companies survives. Firm B merges with firm C to form an entirely new company called BC, and neither B nor C survives. Therefore, this is a consolidation.

All of the following are true of mergers except

A. Mergers are legally straightforward.
B. Approval by shareholder vote of each firm involved in the merger is required.
C. The acquiring firm maintains its name and identity in a merger.
D. A merger may never result from a public offer to the shareholders of the target firm to buy its shares directly.

Answer (A) is incorrect because it is a true statement about mergers.

Answer (B) is incorrect because it is a true statement about mergers.

Answer (C) is incorrect because it is a true statement about mergers.

Answer (D) is correct. A merger is a business combination in which the acquiring firm absorbs a second firm, and the acquiring firm remains in business as a combination of the two merged firms. The acquiring firm usually maintains its name and identity. Mergers are legally straightforward because there is usually a single bidder and payment is made primarily with stock. The shareholders of each firm involved with the merger are required to vote to approve the merger. However, merger of the operations of two firms may ultimately result from an acquisition of stock.
The merger of General Motors and Ford would be categorized as a

A. Diversifying merger.
B. Horizontal merger.
C. Conglomerate merger.
D. Vertical merger.

- Answer (A) is incorrect because a diversifying merger brings together companies in different industries.
- Answer (B) is correct. A horizontal merger occurs when two firms in the same industry combine. General Motors and Ford are both in the automobile industry. A merger of these two companies would be a horizontal merger.
- Answer (C) is incorrect because a conglomerate merger is a combination of two firms in unrelated industries.
- Answer (D) is incorrect because a vertical merger is a combination of a firm with one of its suppliers or customers.

When choosing a merger over an acquisition of stock to accomplish a business combination, which of the following is irrelevant to the decision?

A. Dealing directly with shareholders in an acquisition of stock.
B. Absence of tender by some minority shareholders in a tender offer.
C. Resistance to an acquisition by the target’s management usually causing an increase in the stock price.
D. Whether the companies are in the same industry.

- Answer (A) is incorrect because it supports choosing a merger over an acquisition.
- Answer (B) is incorrect because it supports choosing a merger over an acquisition.
- Answer (C) is incorrect because it supports choosing a merger over an acquisition.
- Answer (D) is correct. Many factors influence whether a transaction should be a merger or an acquisition of stock. Whether the companies are in the same industry or not is usually not a factor. In an acquisition of stock, an acquiring firm usually makes a tender offer directly to the shareholders of another firm to obtain a controlling interest. Therefore, the acquiring firm must directly deal with shareholders of the other firm. There is the possibility that some minority shareholders will not tender their shares. Management may be hostile to the combination, which usually causes an increase in the stock price. This increase will require the acquiring firm to pay more money in its tender offer. On the other hand, a merger is much more straightforward legally. It is usually a negotiated arrangement between a single bidder and the acquired firm. However, a merger does require a formal vote of the shareholders of each of the merging firms, whereas an acquisition does not.

The merger of an oil refinery by a chain of gasoline stations is an example of a

A. Conglomerate merger.
B. White knight.
C. Vertical merger.
D. Horizontal merger.

- Answer (A) is incorrect because a conglomerate merger involves the combination of two firms in unrelated industries.
- Answer (B) is incorrect because a white knight is a firm from which the target firm seeks a competitive offer to avoid being acquired by a less desirable suitor.
- Answer (C) is correct. A vertical merger is the combination of a firm with one or more of its suppliers or customers. The acquiring firm remains in business as a combination of the two merged firms. The chain of gasoline stations is acquiring an oil refinery, which is a supplier. Therefore, this is a vertical merger.
Answer (D) is incorrect because Horizontal mergers combine companies in the same industry.

All of the following statements about acquisition of stock through tender offers is true except

A. Shareholder meetings do not need to be held.
B. A vote is not required.
C. The acquiring firm directly deals with the target firm’s shareholders.
D. All of the outstanding stock of the target firm must be tendered.

Answer (A) is incorrect because It is a true statement about the acquisition of stock through tender offers.
Answer (B) is incorrect because It is a true statement about the acquisition of stock through tender offers.
Answer (C) is incorrect because It is a true statement about the acquisition of stock through tender offers.
Answer (D) is correct. An acquisition of stock by a corporation does not require a formal vote of the target firm’s shareholders. Thus, shareholder meetings do not need to be held. A tender offer is usually made in an acquisition of stock. This is a general invitation by an individual or corporation to the other corporation’s shareholders to tender their shares for a specified price. The acquiring firm or individual must directly deal with the target firm’s shareholders. Minority shareholders are not required to tender their shares. Therefore, not all of the target firm’s stock is usually tendered.

Business combinations are accomplished either through a direct acquisition of assets and liabilities by a surviving corporation or by stock investments in one or more companies. A parent-subsidiary relationship always arises from a

A. Tax-free reorganization.
B. Vertical combination.
C. Horizontal combination.
D. Greater than 50% stock investment in another company.

Answer (A) is incorrect because A tax-free reorganization may or may not be a combination, and it may or may not result in a parent-subsidiary relationship.
Answer (B) is incorrect because Vertical combinations may also be accomplished by a merger or a consolidation, in which case the combining companies become one. A vertical combination combines a supplier or a customer firm with the acquiring company.
Answer (C) is incorrect because Horizontal combinations may also be accomplished by a merger or a consolidation, in which case the combining companies become one. A horizontal combination combines two firms in the same line of business.
Answer (D) is correct. A parent-subsidiary relationship arises from an effective investment in the stock of another enterprise in excess of 50%. The financial statements for the two companies ordinarily should be presented on a consolidated basis. To the extent the corporation is not wholly owned, a minority interest is presented.

An attempt to replace management in which a group of shareholders try to solicit votes is a

A. Tender offer.
B. Takeover.
C. Proxy fight.
D. Leveraged buyout.

Answer (A) is incorrect because A tender offer is a general invitation by an individual or corporation to all shareholders of another corporation to tender (sell) their shares for a specified price.
Answer (B) is incorrect because a takeover is an attempt by one corporation to take control over another by purchasing a majority of common stock.

Answer (C) is correct. A proxy fight is an attempt by dissident shareholders to gain control of the corporation, or at least gain influence, by electing directors. A proxy is a power of attorney given by a shareholder that authorizes the holder to exercise the voting rights of the shareholder. The proxy is limited in its duration, usually for a specific occasion like the annual shareholders’ meeting. The issuer of a proxy statement must file a copy with the SEC 10 days prior to mailing it to shareholders. SEC rules require the solicitor of proxies to give shareholders all material information concerning the issues. A form that indicates the shareholder’s agreement or disagreement must be provided. Also, if the purpose is for voting for directors, proxies must be accompanied by an annual report.

Answer (D) is incorrect because a leveraged buyout is a largely debt-financed acquisition of a firm’s publicly owned stock.

Which of the following is a defensive tactic against a hostile takeover by tender offer?

A. Leveraged buyout (LBO).
B. Acquisition.
C. Conglomerate merger.
D. Saturday night special.

Answer (A) is correct. A leveraged buyout (LBO) entails the company going private. A small group of investors, usually including senior management, purchases the publicly owned stock. The stock is then delisted because it will no longer be traded. Thus, a LBO competes with a hostile tender offer as an alternative.

Answer (B) is incorrect because an acquisition is the purchase of all of another firm’s assets or a controlling interest in its stock.

Answer (C) is incorrect because a conglomerate merger is a combination of two unrelated firms in different industries.

Answer (D) is incorrect because a Saturday night special is direct solicitation of shareholders through advertisements or general mailing.

Which of the following statements about the benefits and costs of mergers is correct?

A. The shareholders of target firms that are acquired substantially benefit.
B. The shareholders of acquiring firms substantially benefit in successful takeovers.
C. The shareholders of target firms not acquired substantially benefit.
D. Both shareholders of the acquiring firm and the target firm are required to receive positive returns.

Answer (A) is correct. Studies have been made to estimate the effect of mergers and takeovers on stock prices of the bidding and target firms. The results suggest that the shareholders of target firms that are acquired receive the greatest benefit. The gains tend to be larger for tender offers than in mergers. This effect is often due to increases in the tender offer because management of a target rejects the initial offer and uses defensive tactics to oppose the takeover. Shareholders of the acquiring firms appear to earn little from takeovers because the gains from the merger tend not to be achieved. Also, shareholders of target firms not acquired frequently receive negative returns.

Answer (B) is incorrect because shareholders of acquiring firms frequently do not benefit in successful takeovers.

Answer (C) is incorrect because the shareholders of target firms not acquired may receive negative returns.

Answer (D) is incorrect because requirements regarding positive returns in business combinations do not exist.
A parent company sold a subsidiary to a group of managers of the subsidiary. The purchasing group invested $1 million and borrowed $49 million against the assets of the subsidiary. This is an example of a

A. Spin-off.
B. Leveraged buyout.
C. Joint venture.
D. Liquidation.

- Answer (A) is incorrect because a spin-off is a divestiture in which the stock of the subsidiary is distributed to the parent company’s stockholders.
- Answer (B) is correct. A leveraged buyout is a financing technique through which a company is purchased using very little equity capital. All of the company’s stock is purchased using mostly borrowed funds. The assets of the acquired company are used as collateral for the loans that financed the purchase.
- Answer (C) is incorrect because a joint venture is an undertaking in which two or more independent companies combine their resources to accomplish a specific objective.
- Answer (D) is incorrect because liquidation is the piecemeal sale of a company’s assets.

Which of the following will reduce average production costs following a merger?

A. A conglomerate merger.
B. The existence of economies of scale.
C. A vertical merger.
D. Net operating losses of an acquired firm.

- Answer (A) is incorrect because a conglomerate merger is the combination of firms in unrelated industries.
- Answer (B) is correct. A reason to merge exists if the value of the combined firm exceeds the sum of the values of the separate firms. The combined firm may operate more efficiently. Following a merger, if the average cost of production falls as a result of production level increases, then there are economies of scale.
- Answer (C) is incorrect because a vertical merger is when a firm combines with a supplier or customer.
- Answer (D) is incorrect because a net operating loss of an acquired firm disappears in taxable reorganizations.

All of the following are potential sources of tax savings in an acquisition except

A. Economies of scale.
B. Net operating losses.
C. Unused debt capacity.
D. Surplus funds of the acquiring firm.

- Answer (A) is correct. Net operating losses (NOLs) are a potential source of tax savings because NOLs can be used to offset an acquiring firms’ taxable income. The combined firm’s capital structure also may allow for increased use of debt financing, which results in tax savings from greater interest reductions. Furthermore, a combination may be the best use of surplus cash from a tax perspective. Dividends received by individual shareholders are fully taxable, whereas the capital gains from a combination are not taxed until the shares are sold. In addition, amounts remitted from the acquired to the acquiring firm are not taxable. However, economies of scale are not a source of tax savings. They are economic savings from joint operation of companies involved in a business combination.
- Answer (B) is incorrect because potential sources of tax savings in an acquisition include net operating losses, unused debt capacity, and surplus funds of the acquiring firm.
Answer (C) is incorrect because Potential sources of tax savings in an acquisition include net operating losses, unused debt capacity, and surplus funds of the acquiring firm.

Answer (D) is incorrect because Potential sources of tax savings in an acquisition include net operating losses, unused debt capacity, and surplus funds of the acquiring firm.

[874] A firm is most likely to be a bargain for an acquirer if

A. Its q ratio is greater than one.
B. Its q ratio is less than one.
C. The replacement cost of its assets is less than the value of the firm’s securities.
D. The combination is more expensive than internal expansion.

- Answer (A) is incorrect because If the q ratio of a firm to be acquired exceeds one, the market value of the firm’s securities exceed the replacement value of assets.
- Answer (B) is correct. Undervaluation of the firm to be acquired may result if the market focuses on short-term earnings rather than long-term prospects. Such a firm may be a bargain for the acquirer. Another aspect of undervaluation is that a firm’s q ratio (market value of the firm’s securities ÷ replacement cost of its assets) may be less than one. Hence, an acquiring firm that wishes to add capacity or diversify into new product lines may discover that a combination is less expensive than internal expansion.
- Answer (C) is incorrect because If replacement cost is less than book value, internal expansion is less expensive.
- Answer (D) is incorrect because Internal expansion may be the better bargain for the acquirer.

[875] Which of the following is true if no synergies occur after the merger of two firms?

A. The shareholders benefit from the reduction in the systematic risk of the combined entity.
B. The value of the combined firms’ debt will be less than the value of the previously separate firms’ debt.
C. Unsystematic risk will be unaffected.
D. The coinsurance effect results in a gain for the bondholders.

- Answer (A) is incorrect because Systematic risk cannot be diversified.
- Answer (B) is incorrect because The debt should be more valuable if the risk of default is lower.
- Answer (C) is incorrect because Unsystematic risk is reduced by diversification.
- Answer (D) is correct. Diversification is sometimes claimed to be an advantage of a combination because it stabilizes earnings and reduces the risks to employees and creditors. Thus, the coinsurance effect applies. If one of the combining firms fails, creditors can be paid from the assets of the other. However, whether shareholders benefit is unclear. One argument supporting the view that diversification by itself does not benefit shareholders is that the decrease in earnings variability increases the value of debt at the expense of equity. Absent synergy, the value of the combined firm is the same as the total of the values of the separate firms. Because the debt increases in value as a result of the decreased risk of default (the coinsurance effect), the value of the equity must therefore decrease if the total value of debt and equity is unchanged.
The coinsurance effect can be reduced by

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<td>A. Yes</td>
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<td>B. Yes</td>
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<td>C. No</td>
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<td>D. No</td>
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- **Answer (A)** is correct. The coinsurance effect can be offset by issuing additional debt after the combination, thereby increasing the firm’s unsystematic risk and decreasing the value of debt. Moreover, the greater leverage may increase the firm’s value. Another possibility is to reduce debt prior to the combination at the lower, pre-combination price and then to reissue the same amount of debt afterward.

- **Answer (B)** is incorrect because Debt should also be issued after the combination.

- **Answer (C)** is incorrect because Debt should also be retired before the combination.

- **Answer (D)** is incorrect because Retirement of debt before and issuance of debt after a combination are strategies to reduce the coinsurance effect.

Ogden Enterprises is a holding company for several successful retail businesses including bookstores, pharmacies, and gourmet food shops. Ogden has excess cash and long-range plans to acquire businesses outside the retail industry. The company is currently considering the acquisition of G-Tech Inc., a company involved in the research and development of genetically engineered pharmaceuticals. G-Tech was founded 4 years ago and received its initial financing from a venture capital group. G-Tech recently submitted its first product to the Food and Drug Administration for testing and is readying a second product for submission; however, it will be several years before either of these products can be marketed. The venture capital group would like to sell the company but does not believe a public offering would do well. G-Tech is in need of cash and close monitoring to improve its operational efficiency. G-Tech is most likely to be an attractive investment to Ogden because of

- Operating synergy, tax considerations, and market power.
- Financial synergy, strategic realignment, and tax considerations.
- Differential efficiency, undervaluation, and operating synergy.
- Strategic realignment, financial synergy, and market power.

- **Answer (A)** is incorrect because Operating synergies and market power are not likely to be involved.
- **Answer (B)** is correct. Financial synergy may result from the combination. The cost of capital for both firms may be decreased because the cost of issuing both debt and equity securities is lower for larger firms. Moreover, uncorrelated cash flow streams will provide for increased liquidity and a lower probability of bankruptcy. Still another benefit is the availability of additional internal capital. The acquired company is often able to exploit new investment opportunities because the acquiring company has excess cash flows. The strategic position of the combined firm also will be improved because G-Tech provides a beachhead in the field of genetically engineered pharmaceuticals. Finally, G-Tech is a development stage enterprise that most likely has a net operating loss carryforward that Ogden, a successful conglomerate, can use to reduce its tax liability.

- **Answer (C)** is incorrect because Undervaluation is not an issue. G-Tech is privately held, so its stock cannot be acquired in the open market at a bargain price.

- **Answer (D)** is incorrect because Market power is not likely to be involved. It will be several years before either of G-Tech’s products can be marketed.
After a merger, the difference between the value of the combined entity and the sum of the values of the separate entities is

A. A pooling of interests.
B. Consolidation.
C. Goodwill.
D. Synergy.

- Answer (A) is incorrect because A pooling of interests is a method of accounting that is no longer permitted for combinations initiated after June 30, 2001.
- Answer (B) is incorrect because Consolidation occurs when a new company is formed after a merger, with neither merging company surviving.
- Answer (C) is incorrect because Goodwill is the excess of the price paid over the fair value of the net assets acquired in a combination.
- Answer (D) is correct. Operational synergy arises because the combined firm may be able to increase its revenues and reduce its costs. For example, the new firm created by a horizontal merger may have a more balanced product line and a stronger distribution system. Furthermore, costs may be decreased because of economies of scale in production, marketing, purchasing, and management. Financial synergy may also result from the combination. The cost of capital for both firms may be decreased because the cost of issuing both debt and equity securities is lower for larger firms. Moreover, uncorrelated cash flow streams will provide for increased liquidity and a lower probability of bankruptcy. Still another benefit is the availability of additional internal capital. The acquired company is often able to exploit new investment opportunities because the acquiring company has excess cash flows.

Which of the following is most likely to be a bad reason for a business combination involving publicly held companies?

A. Diversification.
B. Greater leverage through the increase of debt capacity.
C. Ouster of incumbent management.
D. A breakup value in excess of the cost.

- Answer (A) is correct. Unsystematic risk is unique to the firm and can be diversified in a combination, but shareholders can diversify simply by purchasing shares in a variety of firms. Diversification by individual shareholders is therefore easier and cheaper than by the firm except in the case of closely held firms.
- Answer (B) is incorrect because A combination may permit an increase in the amount of debt in a firm’s optimal capital structure.
- Answer (C) is incorrect because The managers of the acquired firm may be incompetent, or their goals may not be congruent with those of the shareholders.
- Answer (D) is incorrect because A firm may be a target if its breakup value exceeds the cost of its acquisition. Thus, the acquirer may earn a profit by selling the assets piecemeal.

The synergy of a business combination can be determined by

A. Calculating the change in revenue minus the change in cost.
B. Calculating the change in revenue minus the change in taxes.
C. Using the risk adjusted discount rate to discount the incremental cash flows of the newly-formed entity.
D. Using the risk adjusted discount rate to discount the change in revenues of the newly-formed entity.
Answer (A) is incorrect because Discounting the incremental cash flows involves consideration of revenues, costs, taxes, and capital needs.

Answer (B) is incorrect because Discounting the incremental cash flows involves consideration of revenues, costs, taxes, and capital needs.

Answer (C) is correct. Synergy equals the value of the combined firm minus the sum of the values of the separate firms. These values can be calculated using the capital budgeting technique of discounted cash flow analysis. The difference between the cash flows of the combined firm and the sum of the cash flows of the separate firms is discounted at the appropriate rate, usually the cost of equity of the acquired firm. The components of the incremental cash flows are the incremental revenues, costs, taxes, and capital needs.

Answer (D) is incorrect because Discounting the incremental cash flows involves consideration of revenues, costs, taxes, and capital needs.

[881] Which of the following is not a revenue enhancement advantage of acquiring another firm?

A. Improvement of media efforts.
B. A strategic advantage in a new product line.
C. Enlarging an already existing distribution network.
D. Economies of scale.

Answer (A) is incorrect because Improved advertising improves revenues, not reduces costs.

Answer (B) is incorrect because New product lines improve revenues, not reduce costs.

Answer (C) is incorrect because Better distribution networks improve revenues, not reduce costs.

Answer (D) is correct. Economies of scale in production, marketing, purchasing, management, etc., arise from decreasing unit cost resulting from higher levels of activity. Thus, economies of scale produce synergy in the form of cost reduction rather than revenue enhancement.

[882] A company transferred ownership of one of its divisions to the company’s existing shareholders, and the shareholders received new stock representing separate ownership rights in the division. That process is referred to as a

A. Liquidation.
B. Spin-off.
C. Leveraged buyout.
D. Managerial buyout.

Answer (A) is incorrect because In a liquidation, assets are sold piecemeal.

Answer (B) is correct. A spin-off is a type of restructuring that is characterized by establishing a new and separate entity and transferring its newly issued stock to the shareholders of the original company.

Answer (C) is incorrect because In an LBO, the acquirer borrows heavily from third parties to finance the transaction and uses the acquired company’s assets as collateral.

Answer (D) is incorrect because In a managerial buyout, the managers become the owners.
Which of the following defense maneuvers involves the issuance of rights to buy shares at an extremely reduced price upon the occurrence of a takeover?

A. Greenmail.
B. Flip-over rights.
C. A poison pill.
D. Crown jewels.

- Answer (A) is incorrect because Greenmail involves offering the potential acquiror the opportunity to sell his/her already acquired shares back to the corporation above the market value.
- Answer (B) is incorrect because Flip-over rights provide for the target shareholders to acquire in exchange for their stock a relatively greater interest in an acquiring entity.
- Answer (C) is correct. A poison pill may be included in a target corporation’s charter, by-laws, or contracts to reduce its value to potential tender offerors. A poison pill may be, for example, a right granted to the target firm’s shareholders to purchase shares of the merged firm resulting from a takeover. The bidding company loses money on its shares because this right dilutes the value of its stock.
- Answer (D) is incorrect because A crown jewel transfer occurs when the target corporation sells or disposes of one or more assets that made it a desirable target.

A large U.S. company recently set up a new corporation based on the assets from one of its divisions. The stock of the new corporation was titled to the stockholders of the original firm. This change is an example of a

A. Merger.
B. Synergistic merger.
C. Holding company.
D. Divestiture.

- Answer (A) is incorrect because A merger is a combination of companies.
- Answer (B) is incorrect because A synergistic merger is one in which the value of the combined entity exceeds the sum of the values of the separate entities.
- Answer (C) is incorrect because A holding company is a firm that owns sufficient stock in another company to control it.
- Answer (D) is correct. The transaction described is a spin-off, which is a kind of divestiture. The types of divestiture are sale of a subunit to another company, sale of a subunit to the subunit’s management, piecemeal liquidation of the subunit’s assets, and a spin-off. This last form of divestiture is characterized by establishing a new and separate entity and transferring its newly issued stock to the shareholders of the original company.

What is a payment to compensate top management after the occurrence of a takeover called?

A. Greenmail.
B. A golden parachute.
C. A poison pill.
D. Blackmail.

- Answer (A) is incorrect because Greenmail consists of payments to potential bidders to delay or stop unfriendly takeover attempts.
Answer (B) is correct. A golden parachute provides large payments to specified executives if their employment is terminated by the acquiring firm after a takeover. These provisions are passed by the board of directors. Shareholders are unhappy about golden parachute payoffs and have filed suits because they feel that these payoffs enrich management at their expense. In 1984, a change in the tax law imposed a 20% excise tax on these payoffs and provided for their nondeductibility by the corporation. This law was designed to reduce golden parachutes.

Answer (C) is incorrect because a poison pill may be included in a target corporation’s charter, by-laws, or contracts to reduce its value to potential tender offerors.

Answer (D) is incorrect because Blackmail is obtaining a desired result by threats, such as public exposure of a negative attribute, and is usually not relevant to corporate takeover defenses.

A corporation issued a property dividend to its shareholders. The dividend was distributed in the form of 100% of the common stock of a subsidiary. This is known as a

A. Spin-off.
B. Stock split.
C. Scrip dividend.
D. Reverse split.

Answer (A) is correct. A spin-off creates a new, separate entity. It is accomplished by distributing a property dividend in the form of stock of another corporation to shareholders, who then become shareholders of both corporations.

Answer (B) is incorrect because a stock split is accomplished by a corporation issuing additional shares of its own stock to shareholders.

Answer (C) is incorrect because a scrip dividend is one that is payable in the form of notes payable.

Answer (D) is incorrect because a reverse split occurs when a corporation reduces the number of its outstanding shares.

Clover, Inc., recently sold a portion of the firm via an offering of shares in the new entity to public investors. This type of sell-off is classified as a(n)

A. Spin-off.
B. Equity carve-out.
C. Leveraged cash-out.
D. Liquidation.

Answer (A) is incorrect because a spin-off is the creation of a new separate entity from another entity, with the new entity’s shares being distributed on a pro rata basis to existing shareholders of the parent entity.

Answer (B) is correct. An equity carve-out involves the sale of a portion of the firm through an equity offering of shares in the new entity to outsiders.

Answer (C) is incorrect because a leveraged cash-out is borrowing heavily to issue a very large dividend that acts as a poison pill.

Answer (D) is incorrect because in a liquidation, assets are sold piecemeal.
BigCo, a large conglomerate, has a division that has developed a new and highly promising technology. BigCo would like to retain control of this division but also raise additional capital to support the further development of this technology. BigCo also realizes this promising technology is different than its usual business lines and will require a new management style and incentive program to attract and maintain talent. Which one of the following would best allow BigCo to achieve these objectives?

A. A spin-off of the division.
B. Sale of the division to another firm.
C. A management buy-out of the division.
D. An equity carve-out of the division.

- Answer (A) is incorrect because a spin-off is the creation of a new entity separate from another entity, with the new entity’s shares being distributed on a pro rata basis to existing shareholders of the parent entity. A spin-off is essentially a type of dividend to existing shareholders.
- Answer (B) is incorrect because a sale of the division to another firm would not allow BigCo to retain control of the division. This alternative will not allow BigCo to achieve its objectives.
- Answer (C) is incorrect because a management buy-out of the division would not fit the objective of wanting a new management style and incentive program to attract and maintain talent.
- Answer (D) is correct. An equity carve-out involves the sale of a portion of the firm through an equity offering of shares in the new entity to outsiders. This would allow BigCo to raise additional capital as well as bring in new management while still maintaining control, as it does not have to sell the whole division to achieve an equity-carve-out.

Chapter 7 of the Federal Bankruptcy Code will grant a debtor a discharge when the debtor

A. Is a corporation or a partnership.
B. Is an entity, other than a partnership or corporation, that could successfully reorganize under Chapter 11 of the Federal Bankruptcy Code.
C. Is an insurance company.
D. Unjustifiably destroyed information relevant to the bankruptcy proceeding.

- Answer (A) is incorrect because partnerships and corporations do not receive a general discharge under Chapter 7. They are simply liquidated.
- Answer (B) is correct. A general discharge of most debts is provided a person (but not a partnership or corporation) under Chapter 7. Certain entities are not eligible, including railroads, insurance companies, banks, credit unions, and savings and loan associations. Liquidation and discharge under Chapter 7 are not restricted to cases in which Chapter 11 reorganization would not be successful.
- Answer (C) is incorrect because insurance companies are ineligible to file under Chapter 7.
- Answer (D) is incorrect because destroying information can result in denial of a general discharge. Only if it is justified, e.g., accidental destruction not intended to defraud creditors, might it not result in denial of discharge.

Which of the following is indicative of insolvency?

A. Payments to creditors are late.
B. The market value of the firm’s stock has declined substantially.
C. Operating cash flows of the firm cannot meet current obligations.
D. Dividends are not declared because of inadequate retained earnings.

- Answer (A) is incorrect because late payments are an early signal of potential insolvency.
Answer (B) is incorrect because a declining share price is an early signal of potential insolvency.

Answer (C) is correct. A firm is insolvent when its debts exceed its assets (stock-based insolvency) or when its cash flows are inadequate to meet maturing obligations (flow-based insolvency).

Answer (D) is incorrect because elimination of dividends is an early signal of potential insolvency.

A plan of reorganization formulated under Chapter 11 must be submitted to the creditors for acceptance and to the court for confirmation. Which of the following is correct?

A. The effect of confirmation is to make the plan binding on all parties and to grant the debtor a discharge from claims not protected by the plan.

B. A plan cannot be confirmed if any impaired class of claims or interests rejects it.

C. If no class of claims or interests accepts a plan, the court may nevertheless confirm it if the plan is in the best interests of the creditors.

D. A class that is not impaired is presumed to accept, but more than half of the claims in a class by amount must accept if the class is impaired.

Answer (A) is correct. Confirmation is the court’s approval of the plan after notice and a hearing. Confirmation makes the plan binding on the creditors, equity security holders, and debtor, whether or not they accepted the plan. It also operates as a discharge of unprotected debts, except for those claims previously denied discharge in a Chapter 7 case, and vests the estate property in the debtor. Confirmation is contingent upon the plan’s feasibility, the good faith in which it was proposed, and the provision for cash payment of certain allowed claims, such as administration expenses.

Answer (B) is incorrect because an impaired class may be required to accept a plan over its objection if the court finds that the plan is “fair and equitable,” for instance, if no junior claim or interest receives anything.

Answer (C) is incorrect because at least one class of claims (not ownership interests) must accept.

Answer (D) is incorrect because a class of claims accepts if approval is given by more than half the allowed claims, provided they represent at least two-thirds of the claims by amount. A class of interests (shareholders) accepts if approval is given by two-thirds in amount of the allowed interests.

Which of the following is not an early signal of potential financial distress?

A. Negative earnings.
B. Employee layoffs.
C. Rapidly falling stock prices.
D. Stagnant cash flows.

Answer (A) is incorrect because negative earnings are an early signal of potential insolvency.

Answer (B) is incorrect because layoffs are an early signal of potential insolvency.

Answer (C) is incorrect because a declining share price is an early signal of potential insolvency.

Answer (D) is correct. Mere stagnation of cash flows does not indicate potential insolvency. Flow-based insolvency occurs when cash flows are inadequate, not when they are simply not growing at the desired rate.
A plan of reorganization under Chapter 11

A. May be filed by any party in interest for 120 days after entry of the order for relief.
B. Must be filed by the trustee and approved by the creditors within 180 days after entry of the order for relief.
C. Must treat all classes of claims and ownership interests equally.
D. Must treat all claims or interests in the same class equally.

- Answer (A) is incorrect because Only the debtor may file a plan within 120 days after entry of the order for relief.
- If the debtor fails to file or if the creditors do not approve of the plan within 180 days of the entry of the order for relief, any party in interest (including the trustee) may file a plan.
- Answer (B) is incorrect because Only the debtor may file a plan within 120 days after entry of the order for relief.
- If the debtor fails to file or if the creditors do not approve of the plan within 180 days of the entry of the order for relief, any party in interest (including the trustee) may file a plan.
- Answer (C) is incorrect because The plan must be fair and equitable but all classes need not be treated the same.
- However, no party may receive less than the amount that would have been distributed in a liquidation.
- Answer (D) is correct. A Chapter 11 plan must designate classes of creditors’ claims and owners’ interests; state the treatment to be given each class; indicate which classes will or will not be impaired; allow for equal treatment of the members within a class unless they agree otherwise; and provide for an adequate method of payment. If the debtor is a corporation, the plan must also protect voting rights, state that no nonvoting stock will be issued, and require that selection of officers and directors be effected in a manner to protect the parties in interest.

Insolvency is

A. A low cash balance.
B. Lack of liquidity.
C. Not being able to pay one’s debts.
D. Lack of borrowing capacity.

- Answer (A) is incorrect because A low cash balance does not, by itself, indicate insolvency.
- Answer (B) is incorrect because Lack of liquidity does not, by itself, indicate insolvency.
- Answer (C) is correct. A firm is insolvent when its debts exceed its assets (stock-based insolvency) or when its cash flows are inadequate to meet maturing obligations (flow-based insolvency).
- Answer (D) is incorrect because A lack of borrowing capacity does not, by itself, indicate insolvency.

Which of the following is the most likely option to be chosen by an insolvent firm?

A. Increase R&D and capital expenditures.
B. Purchase a stable firm.
C. File for bankruptcy.
D. Repurchase stock.

- Answer (A) is incorrect because The firm is more likely to cut costs.
- Answer (B) is incorrect because An insolvent firm is more likely a takeover target.
- Answer (C) is correct. An insolvent firm may agree to be acquired by a stronger firm or it may sell important assets, slash costs, issue additional securities, negotiate with creditors to restructure its obligations, or exchange equity for debt. It may also choose a reorganization in bankruptcy. A final option is bankruptcy liquidation.
A firm may benefit from insolvency in all but which of the following ways?

A. Being forced to focus upon core operations.
B. Realigning its capital structure.
C. Entering Chapter 11 bankruptcy proceedings and reorganizing the firm.
D. Being forced to liquidate the business.

Answer (A) is incorrect because focusing on core operations is a possible advantage.
Answer (B) is incorrect because capital restructuring is a possible advantage.
Answer (C) is incorrect because reorganization under the protection of Chapter 11 is a possible advantage.
Answer (D) is correct. Benefits of insolvency may include restructuing of the firm’s assets and capital structure, divestiture of noncore operations, development of new strategies and new forms of organization, and relief from creditors’ actions while the firm is in a Chapter 11 reorganization. However, being forced to liquidate is the result that a firm most wants to avoid.

Which of the following, if any, may be commenced by the filing of a voluntary or an involuntary petition in a bankruptcy court?

<table>
<thead>
<tr>
<th>Chapter 7</th>
<th>Chapter 11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquidation</td>
<td>Reorganization</td>
</tr>
<tr>
<td>A.</td>
<td>Yes</td>
</tr>
<tr>
<td>B.</td>
<td>Yes</td>
</tr>
<tr>
<td>C.</td>
<td>No</td>
</tr>
<tr>
<td>D.</td>
<td>No</td>
</tr>
</tbody>
</table>

Answer (A) is correct. In a Chapter 7 liquidation or in a Chapter 11 reorganization, a voluntary or an involuntary petition is filed in the federal bankruptcy court. An involuntary petition must be joined by three or more creditors with unsecured claims of at least $14,425 if the debtor has 12 or more creditors. If there are fewer than 12, one creditor with a claim of at least $14,425 may file.

Answer (B) is incorrect because both liquidation and reorganization may be commenced by either a voluntary or an involuntary petition.
Answer (C) is incorrect because both liquidation and reorganization may be commenced by either a voluntary or an involuntary petition.
Answer (D) is incorrect because both liquidation and reorganization may be commenced by either a voluntary or an involuntary petition.

After a petition for bankruptcy liquidation has been filed and the court has issued an order for relief,

A. The court usually appoints a permanent trustee to take control of the debtor’s estate.
B. Creditors must immediately cease their collection activities.
C. The bankruptcy judge notifies creditors, collects the debtor’s nonexempt property, and distributes that property to the creditors.
D. A meeting is held by the creditors to vote on a plan of reorganization.
Answer (A) is incorrect because the court usually appoints a temporary trustee, and the creditors usually elect a permanent trustee.

Answer (B) is correct. A debtor files a bankruptcy petition to obtain relief from creditors’ collection efforts. Creditors may file to ensure an equitable division of the debtor’s estate, an outcome that may not be reached if creditors are allowed to continue their individual collection activities. Thus, the order for relief stays those activities.

Answer (C) is incorrect because the trustee, not the judge, administers the estate.

Answer (D) is incorrect because the creditors vote on a plan of reorganization under Chapter 11.

[899] The creditors of a firm have filed an involuntary petition seeking a Chapter 7 liquidation of the firm under federal bankruptcy law. The firm contests the petition. What is a basis for the court denying the petition?

A. A custodian took possession of the debtor’s property to enforce a lien 60 days prior to filing.
B. A custodian took possession of the debtor’s property to enforce a lien 120 days prior to filing.
C. The debtor has 12 creditors and three creditors with unsecured claims totaling $14,425 joined in the petition.
D. The debtor has 10 creditors and one creditor with a claim of $10,000 filed.

Answer (A) is incorrect because a contested involuntary petition will be granted if the debtor is not paying its bills when due or if, within 120 days prior to filing, a custodian took possession of the debtor’s property to enforce a lien.

Answer (B) is incorrect because an involuntary petition will be granted if the debtor is not paying its bills when due or if, within 120 days prior to filing, a custodian took possession of the debtor’s property to enforce a lien.

Answer (C) is incorrect because the plaintiff’s claims total at least $14,425 and the involuntary petition is joined by three creditors with unsecured claims.

Answer (D) is correct. An involuntary petition must be joined by three or more creditors with unsecured claims totaling at least $14,425 if the debtor has 12 or more creditors. If there are fewer than 12, one creditor with a claim of at least $14,425 may file.

[900] The correct priority of claims in a bankruptcy liquidation is

A. Administrative expenses, wage claims of no more than $4,650, taxes due, claims of general or unsecured creditors, and shareholder claims.
B. Administrative expenses, wage claims of no more than $4,650, taxes due, shareholder claims, and debtholder claims.
C. All wage claims, administrative expenses, debtholder claims, taxes due, and shareholder claims.
D. All wage claims, administrative expenses, debtholder claims, shareholder claims, and taxes due.

Answer (A) is correct. After secured creditors receive the proceeds of the sale of specific collateral, the other assets are distributed according to the following scheme: (1) administrative expenses, (2) claims of gap creditors, (3) wages of no more than $4,650, (4) unpaid contributions to employee benefit plans, (5) customer deposits, (6) taxes, (7) certain unfunded pension plan liabilities, (8) claims of general or unsecured creditors, (9) claims of preferred shareholders, and (10) claims of common shareholders.

Answer (B) is incorrect because shareholders receive payment before shareholders.

Answer (C) is incorrect because administrative expenses come first and taxes come before debtholder claims.

Answer (D) is incorrect because administrative expenses come first and taxes come before debtholder claims.
A discharge in bankruptcy under Chapter 7 (liquidation) may be obtained by an Individual Corporation Partnership

A. Yes Yes Yes
B. No Yes Yes
C. Yes No No
D. No No Yes

- Answer (A) is incorrect because Individuals but not corporations and partnerships may receive a discharge.
- Answer (B) is incorrect because Individuals but not corporations and partnerships may receive a discharge.
- Answer (C) is correct. Individual debtors may receive a discharge under Chapter 7 from most debts that remain unpaid after distribution of the debtor’s estate. However, corporations and partnerships are merely liquidated. They are not eligible for a Chapter 7 discharge.
- Answer (D) is incorrect because Individuals but not corporations and partnerships may receive a discharge.

Chapter 11 of the bankruptcy law concerns reorganizations. Under Chapter 11,

A. Individuals are not eligible debtors.
B. A case may be commenced only by a voluntary petition.
C. Insolvency is condition precedent to the filing of a petition.
D. The primary purpose is usually the continuation of the business.

- Answer (A) is incorrect because Partnerships, corporations, and any person who may be a debtor under Chapter 7 (except stock and commodity brokers) are eligible debtors under Chapter 11.
- Answer (B) is incorrect because A reorganization may be commenced by a voluntary or involuntary petition.
- Answer (C) is incorrect because The debtor need not be insolvent.
- Answer (D) is correct. A Chapter 11 reorganization allows a distressed business enterprise to restructure its finances. The primary purpose of the restructuring is usually the continuation of the business. Reorganization is a process of negotiation whereby the debtor firm and its creditors develop a plan for the adjustment and discharge of debts.

Which of the following is a true statement about a plan of reorganization in a Chapter 11 bankruptcy case?

A. A debtor may have the exclusive right to file a plan of reorganization for a certain period.
B. A plan of reorganization must treat all creditors similarly.
C. Only a committee of creditors may file a plan of reorganization.
D. The plan of reorganization must be approved by a supermajority of each class of creditors.

- Answer (A) is correct. The debtor has the exclusive right to file a plan during the 120 days after the order for relief is issued by the court, unless a trustee has been appointed, and may file a plan of reorganization at any time.
- Answer (B) is incorrect because A plan of reorganization must divide creditors’ claims and shareholders’ interests into classes, and claims in each class must be treated equally.
- Answer (C) is incorrect because The debtor may file a plan at any time.
Answer (D) is incorrect because To become effective, the plan ordinarily must be accepted by a certain percentage (usually, at least two-thirds) of persons whose rights as creditors or owners have been impaired, provide for full payment of administration expenses, and be confirmed (approved and put into operation) by the bankruptcy court. Furthermore, a bankruptcy court may force an impaired class of creditors to participate in, and the court may confirm, a plan of reorganization that is fair and equitable to the impaired class.

[904] The trusteeship function in a Chapter 11 bankruptcy reorganization is usually performed by the

A. Court.
B. Debtor-in-possession.
C. Committee of creditors.
D. Examiner.

Answer (A) is incorrect because The court may sometimes appoint a trustee but does not serve as trustee.
Answer (B) is correct. In a Chapter 11 reorganization, the court has limited power to appoint a trustee. Instead, to better accomplish the rehabilitative aspirations of a reorganization, a firm seeking protection under Chapter 11 may be permitted to operate its own business as a debtor-in-possession. A strong presumption exists that a debtor-in-possession should be permitted to continue to operate the business unless there is evidence of incompetence or mismanagement on the part of the debtor. A debtor-in-possession has basically all the same rights and duties as a trustee but does not receive special compensation for performing the function.
Answer (C) is incorrect because The committee consults with the court, the debtor, and the trustee; investigates the debtor’s affairs; and participates in formulating the plan of reorganization.
Answer (D) is incorrect because An examiner may be appointed to examine allegations of fraud, misconduct, or mismanagement.

[905] A firm is being liquidated several months after its Chapter 7 bankruptcy filing. The receiver has compiled the following information.

<table>
<thead>
<tr>
<th>Assets</th>
<th>$100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common shares (at par)</td>
<td>22,000</td>
</tr>
<tr>
<td>Preferred shares (at par)</td>
<td>5,000</td>
</tr>
<tr>
<td>Secured bonds</td>
<td>50,000</td>
</tr>
<tr>
<td>Senior unsecured debt</td>
<td>27,000</td>
</tr>
<tr>
<td>Junior unsecured debt</td>
<td>18,000</td>
</tr>
<tr>
<td>Wage payable</td>
<td>7,000</td>
</tr>
<tr>
<td>Taxes owed</td>
<td>3,000</td>
</tr>
<tr>
<td>Credit from suppliers since filing</td>
<td>2,000</td>
</tr>
<tr>
<td>Court/trustee costs</td>
<td>1,500</td>
</tr>
</tbody>
</table>

Based on this information, what percentage of their claims will junior creditors receive?

A. 53%
B. 64%
C. 81%
D. 100%
Answer (A) is correct. Before the junior creditors are paid, secured bonds, court/trustee costs, credit from suppliers since filing, wages payable, taxes owed, and senior creditors must all be paid (in that order). After all of these debts are paid, the firm is left with $9,500 ($100,000 – $50,000 – $1,500 – $2,000 – $7,000 – $3,000 – $27,000) that the junior creditor is entitled to. The junior creditors will receive 53% of their claims ($9,500 ÷ $18,000). Please note that shareholders are last in line to the claims.

Answer (B) is incorrect because The credit from suppliers since filing claim must be paid before the claim for the unsecured debt. The amount of 64% fails to take that claim into account.

Answer (C) is incorrect because The credit from suppliers since filing claim and the taxes owed must be paid before the claim for the unsecured debt. The amount of 81% fails to take both of these claims into account.

Answer (D) is incorrect because The junior creditor has total claims of $18,000. Because there is only $9,500 left, (s)he will not recover 100% of his/her claims.

[906] The Bretton Woods Agreement of 1944

A. Established the gold standard.
B. Pegged the dollar to gold and other currencies to the dollar.
C. Established a system of managed floating exchange rates.
D. Established floating exchange rates.

- Answer (A) is incorrect because The world began operating on a gold standard is 1870. In 1944, the system was changed to a modified gold standard.
- Answer (B) is correct. The Bretton Woods Agreement abolished the gold standard that had existed since 1870 in favor of a modified gold standard. Under the modified gold standard, the U.S. dollar was pegged to gold, and other currencies were then pegged to the dollar.
- Answer (C) is incorrect because Managing floating exchange rates were not adopted until the Jamaica Agreement of 1976.
- Answer (D) is incorrect because Floating exchange rates did not occur until 1971.

[907] What is the role of gold in the present international monetary system?

A. Gold is quoted in United States dollars only.
B. All of the major currencies of the world, except the United States dollar, have a fixed value in terms of gold.
C. Gold is like any other asset whose value depends upon supply and demand.
D. Gold is the reserve asset of the International Monetary Fund.

- Answer (A) is incorrect because Although most exchanges quote the price of gold in U.S. dollars, the dollar’s value is not linked to that of gold.
- Answer (B) is incorrect because Floating exchange rates have existed since about 1973. Tying currency values to a gold standard, in effect, fixes exchange rates.
- Answer (C) is correct. Gold has no special role in the modern international monetary system. The present system is based upon managed floating currency exchange rates. Consequently, gold is treated as a commodity, the price of which depends upon supply and demand.
- Answer (D) is incorrect because The only reserves of the IMF are international currencies.
Freely fluctuating exchange rates perform which of the following functions?

A. They automatically correct a lack of equilibrium in the balance of payments.
B. They make imports cheaper and exports more expensive.
C. They impose constraints on the domestic economy.
D. They eliminate the need for foreign currency hedging.

- Answer (A) is correct. In a freely floating exchange rate system, the government steps aside and allows exchange rates to be determined entirely by the market forces of supply and demand. The advantage of such a system is that it tends to automatically correct any disequilibrium in the balance of payments. The disadvantage is that a freely floating system makes a country vulnerable to economic conditions in other countries.
- Answer (B) is incorrect because forcing imports to be cheaper and exports more expensive can be accomplished with a fixed exchange rate system.
- Answer (C) is incorrect because freely floating exchange rates impose no constraints on the domestic economy.
- Answer (D) is incorrect because a freely floating exchange rate system does not eliminate transaction risk (which must be hedged).

In foreign currency markets, the phrase “managed float” refers to the

A. Tendency for most currencies to depreciate in value.
B. Discretionary buying and selling of currencies by central banks.
C. Necessity of maintaining a highly liquid asset, such as gold, to conduct international trade.
D. Fact that actual exchange rates are set by private business people in trading nations.

- Answer (A) is incorrect because currencies do not have an inherent tendency to depreciate or appreciate.
- Answer (B) is correct. Exchange rates “float” when they are set by supply and demand, not by agreement among countries. In a managed float, central banks buy and sell currencies at their discretion to avoid erratic fluctuations in the foreign currency market. The objective of such transactions is to “manage” the level at which a particular currency sells in the open market. For instance, if there is an oversupply of a country’s currency on the foreign currency market, the central bank will purchase that currency to support the market.
- Answer (C) is incorrect because currencies no longer have to be supported by gold.
- Answer (D) is incorrect because central banks, not private business people, manage the quantity of currency on the market.

One may characterize the current international monetary system developed by the industrialized countries as a

A. Clean float. Freely floating exchange rates are determined solely by the forces of demand and supply.
B. Managed or dirty float. Central banks intervene in the foreign exchange market to influence the exchange rates.
C. Stable-rate system.
D. Gold-based system.

- Answer (A) is incorrect because a clean float system does not exist owing to central bank intervention.
- Answer (B) is correct. Today’s international monetary system usually permits exchange rates to float freely. However, central banks occasionally intervene to avoid large fluctuations. Accordingly, the system is called a managed or dirty float system.
- Answer (C) is incorrect because as a result of the floating exchange rate system, rates are not stable.
- Answer (D) is incorrect because the gold-based system was abandoned in 1973.
[911] If the U.S. dollar-peso exchange rate is $1 for 9 pesos, a product priced at 45 pesos will cost a U.S. consumer

A. $0.20  
B. $5  
C. $45  
D. $405

- Answer (A) is incorrect because the amount of $0.20 is based on an inversion of the numerator and denominator in the calculation.
- Answer (B) is correct. At a 1-for-9 rate, the price in U.S. dollars is $5, calculated by dividing 45 pesos by 9.
- Answer (C) is incorrect because the amount of $45 is the price in pesos, not dollars.
- Answer (D) is incorrect because the amount of $405 is based on multiplying 45 and 9.

[912] If a U.S. firm can buy £20,000 for $100,000, the rate of exchange for the pound is

A. $.20  
B. $5  
C. $20  
D. $50

- Answer (A) is incorrect because the amount of $.20 is the exchange rate for the dollar, not the pound.
- Answer (B) is correct. Dividing $100,000 by £20,000 produces an exchange rate of $5 to the pound.
- Answer (C) is incorrect because the exchange rate is $5 to the pound.
- Answer (D) is incorrect because the exchange rate is $5 to the pound.

[913] One U.S. dollar is being quoted at 100 Japanese yen on the spot market and at 102.5 Japanese yen on the 90-day forward market; hence, the annual effect in the forward market is that the U.S. dollar is at a

A. Premium of 10%.  
B. Premium of 2.5%.  
C. Discount of 10%.  
D. Discount of 0.025%.

- Answer (A) is correct. A forward currency premium or discount is calculated by multiplying the percentage spread by the number of forward periods in a year:

\[
\text{Forward premium} = \left(\frac{\text{Forward rate} - \text{Spot rate}}{\text{Spot rate}}\right) \times \frac{\text{Days in year}}{\text{Days in forward period}}
\]

In this case, the calculation is as follows:

Forward premium = \(\left(\frac{¥102.5 - ¥100}{¥100}\right) \times (360 / 90)\)

= \(0.025 \times 4\)

= 10%

- Answer (B) is incorrect because this percentage is the premium for 90 days.
Answer (C) is incorrect because the effect is a 10% premium, not discount.
Answer (D) is incorrect because the 90-day effect is a 2.5% or 0.025 premium.

[914] Assume the spot rate of the Canadian dollar is $.90. If the spot rate one year from now is $.85, the Canadian dollar will have

A. Appreciated by 5.56%.
B. Depreciated by 5.56%.
C. Appreciated by 5.88%.
D. Depreciated by 5.88%.

Answer (A) is incorrect because the Canadian dollar will depreciate rather than appreciate.
Answer (B) is correct. After a year’s time, a single Canadian dollar now fetches fewer U.S. dollars, indicating a loss of purchasing power (depreciation). The spread is 5.56% \[\frac{(.90 – .85)}{.90}\].
Answer (C) is incorrect because the Canadian dollar will depreciate rather than appreciate, and the spread is 5.56%.
Answer (D) is incorrect because the depreciation by 5.88% results from using .85 in the denominator instead of .90.

[915] Given a spot rate of $1.8655 and a 90-day forward rate of $1.8723, the pound sterling in the forward market is

A. Being quoted at a premium.
B. Being quoted at a discount.
C. Undervalued.
D. Overvalued.

Answer (A) is correct. The pound costs more on the forward market than it does on the spot market, indicating an anticipated gain in purchasing power (resulting in a forward premium).
Answer (B) is incorrect because the price is quoted at a discount if the spot rate is higher than the forward rate.
Answer (C) is incorrect because undervaluation refers to comparisons of currencies.
Answer (D) is incorrect because overvaluation refers to comparisons of currencies.

[916] Given a spot exchange rate for the U.S. dollar against the pound sterling of 1.4925 and a 90-day forward rate of 1.4775

A. The dollar is at a discount against the pound and undervalued in the forward market.
B. The dollar is at a premium against the pound and overvalued in the forward market.
C. The forward dollar is at a discount against the pound.
D. The forward dollar is at a premium against the pound.

Answer (A) is incorrect because there is no way to tell if the rates are over- or undervalued.
Answer (B) is incorrect because there is no way to tell if the rates are over- or undervalued.
Answer (C) is correct. The dollar costs less on the forward market than it does on the spot market, indicating an anticipated loss of purchasing power (resulting in a forward discount).
Answer (D) is incorrect because the dollar is selling at a discount, not a premium.
If the value of the U.S. dollar in foreign currency markets changes from $1 = .75 euros to $1 = .70 euros,

A. The euro has depreciated against the dollar.
B. Products imported from Europe to the U.S. will become more expensive.
C. U.S. tourists in Europe will find their dollars will buy more European products.
D. U.S. exports to Europe should decrease.

- Answer (A) is incorrect because Since it now takes fewer euros to buy a single dollar, the euro has appreciated (gained purchasing power) relative to the dollar.
- Answer (B) is correct. Since it now takes fewer euros to buy a single dollar, the dollar has declined in value relative to the euro; i.e., the euro has gained purchasing power. As a result, imports from Europe will become more expensive and will tend to decrease.
- Answer (C) is incorrect because Since a dollar will now fetch fewer euros than before, U.S. tourists will find European goods more expensive.
- Answer (D) is incorrect because Since the euro has gained purchasing power against the dollar, U.S. exports should increase.

Exchange rates are determined by

A. Each industrial country’s government.
B. The International Monetary Fund.
C. Supply and demand in the foreign currency market.
D. Exporters and importers of manufactured goods.

- Answer (A) is incorrect because Governments have only temporary influence, if any, on the setting of exchange rates.
- Answer (B) is incorrect because The International Monetary Fund has only temporary influence, if any, on the setting of exchange rates.
- Answer (C) is correct. Although currencies can be supported by various means for short periods, the primary determinant of exchange rates is the supply of and demand for the various currencies. Under current international agreements, exchange rates are allowed to “float.” During periods of extreme fluctuations, however, governments and control banks may intervene to maintain stability in the market.
- Answer (D) is incorrect because Exporters and importers have only temporary influence, if any, on the setting of exchange rates.

If consumers in Japan decide they would like to increase their purchases of consumer products made in the United States, in foreign currency markets there will be a tendency for

A. The supply of dollars to increase.
B. The supply of dollars to decrease.
C. The Japanese yen to appreciate relative to the U.S. dollar.
D. The demand for dollars to increase.

- Answer (A) is incorrect because The demand for dollars, not the supply, will be affected by the decision to purchase additional U.S. products.
- Answer (B) is incorrect because The demand for dollars, not the supply, will be affected by the decision to purchase additional U.S. products.
Answer (C) is incorrect because the dollar should appreciate relative to the yen owing to the increased demand for dollars.

Answer (D) is correct. The increase in demand for U.S. products will increase the demand for the dollars necessary to pay for those products.

If the exchange rate has changed from 1 U.S. dollar to 5 foreign currency units (FCUs) to a rate of 1 U.S. dollar to 5.5 FCUs,

A. The U.S. dollar has appreciated by 10%.
B. The U.S. dollar has depreciated by 10%.
C. The FCU has appreciated by 20%.
D. The FCU has depreciated by 20%.

Answer (A) is correct. A single U.S. dollar now fetches more FCUs than before, indicating a gain in purchasing power (appreciation). The spread is 10% \(\left[\frac{5.5 - 5.0}{5.0}\right]\).

Answer (B) is incorrect because the U.S. dollar has appreciated in value. It will now purchase more FCUs.

Answer (C) is incorrect because the FCU is depreciating, not appreciating.

Answer (D) is incorrect because the FCU has depreciated by 9.09%.

The spot rate for one Australian dollar is US $0.92685 and the 60-day forward rate is US $0.93005. Which one of the following statements is consistent with these facts?

A. The U.S. dollar is trading at a forward discount with respect to the Australian dollar.
B. The U.S. dollar is trading at a forward premium with respect to the Australian dollar.
C. The U.S. dollar has lost purchasing power with respect to the Australian dollar.
D. The U.S. dollar has gained purchasing power with respect to the Australian dollar.

Answer (A) is correct. The exchange rate for the Australian dollar is higher in the forward market than the spot market; the Australian dollar is therefore trading at a forward premium. From this, it follows that the U.S. dollar is trading at a forward discount.

Answer (B) is incorrect because the U.S. dollar is trading at a forward discount with respect to the Australian dollar.

Answer (C) is incorrect because no conclusion about purchasing power changes can be drawn without information about past exchange rates.

Answer (D) is incorrect because no conclusion about purchasing power changes can be drawn without information about past exchange rates.

If the dollar price of the euro rises, which of the following will occur?

A. The dollar depreciates against the euro.
B. The euro depreciates against the dollar.
C. The euro will buy fewer European goods.
D. The euro will buy fewer U.S. goods.

Answer (A) is correct. As the dollar price of the euro rises, the euro’s buying power increases (i.e., it can be exchanged for more dollars than before). Thus, the buying power of the dollar has decreased.
Answer (B) is incorrect because if the dollar price of the euro rises, the euro’s buying power increases (i.e., it can be exchanged for more dollars than before).

Answer (C) is incorrect because the euro’s value with respect to European goods is not affected by its value with respect to the dollar.

Answer (D) is incorrect because if the dollar price of the euro rises, the euro’s buying power increases, and the euro will buy more, not fewer, U.S. goods.

[923] What is the effect on prices of U.S. imports and exports when the dollar depreciates?

A. Import prices and export prices will decrease.
B. Import prices will decrease and export prices will increase.
C. Import prices will increase and export prices will decrease.
D. Import prices and export prices will increase.

- Answer (A) is incorrect because import prices will increase because the U.S. dollar purchases less of the foreign currency equivalent.
- Answer (B) is incorrect because an appreciated dollar would result in a decrease of import prices and an increase in export prices.
- Answer (C) is incorrect. When the U.S. dollar depreciates, U.S. products become cheaper to foreign consumers. A depreciated dollar acts as a subsidy to exports by decreasing their price. The opposite is true for imports. When the dollar depreciates (loses purchasing power), imports become more costly. Thus, a depreciated U.S. dollar increases the prices of imported goods.
- Answer (D) is incorrect because a depreciated dollar will decrease the price of export because they become cheaper in the foreign market.

[924] What is the effect when a foreign competitor’s currency becomes weaker compared to the U.S. dollar?

A. The foreign company will have an advantage in the U.S. market.
B. The foreign company will be disadvantaged in the U.S. market.
C. The fluctuation in the foreign currency’s exchange rate has no effect on the U.S. company’s sales or cost of goods sold.
D. It is better for the U.S. company when the value of the U.S. dollar strengthens.

- Answer (A) is correct. If the foreign currency weakens compared with the U.S. dollar, the U.S. dollar will have more buying power in the foreign company’s country. Thus, the foreign company will be able to sell more products than the U.S. company for the same amount of dollars.
- Answer (B) is incorrect because a weakening foreign currency makes foreign-produced products cheaper per U.S. dollar.
- Answer (C) is incorrect because a weakening of the foreign currency will decrease the foreign company’s prices relative to the U.S. company’s.
- Answer (D) is incorrect because a strengthening U.S. dollar can buy more of a weakening foreign currency (i.e., products produced in that country), effectively increasing the price of U.S.-produced products in the foreign market.
[925] An overvalued foreign currency exchange rate

A. Represents a tax on exports and a subsidy to imports.
B. Represents a subsidy to exports and a tax on imports.
C. Has an effect on capital flows but no effect on trade flows.
D. Has no effect on capital flows but does affect trade flows.

- Answer (A) is correct. If a country’s currency is strong, its goods and services are more expensive to foreign consumers. At the same time, foreign goods become relatively more affordable to domestic consumers.
- Answer (B) is incorrect because An overvalued domestic currency will have the opposite effect.
- Answer (C) is incorrect because Both will be affected.
- Answer (D) is incorrect because Both will be affected.

[926] The U.S. dollar has a free-floating exchange rate. When the dollar has fallen considerably in relation to other currencies, the

A. Trade account in the U.S. balance of payments is neither in a deficit nor in a surplus because of the floating exchange rates.
B. Capital account in the U.S. balance of payments is neither in a deficit nor in a surplus because of the floating exchange rates.
C. Fall in the dollar’s value cannot be expected to have any effect on the U.S. trade balance.
D. Cheaper dollar helps U.S. exporters of domestically produced goods.

- Answer (A) is incorrect because The trade account still has a deficit despite the cheaper dollar. Imports continue to exceed exports because patterns of consumption are slow to change.
- Answer (B) is incorrect because The capital account benefits from the cheaper dollar. Foreigners can buy more dollars with fewer yen, marks, etc. Moreover, foreign capital inflow increases because of the federal government’s budget deficits. Hence, the U.S. experiences a net capital inflow.
- Answer (C) is incorrect because The fall in the dollar has a positive effect on the nation’s trade deficit. Exports increase and imports decrease.
- Answer (D) is correct. A decline in the value of the dollar relative to other currencies lowers the price of U.S. goods to foreign consumers. Thus, exporters of goods produced in the U.S. benefit. Simultaneously, a low value for the dollar decreases imports by making foreign goods more expensive.

[927] If the U.S. dollar declines in value relative to the currencies of many of the U.S. trading partners, the likely result is that

A. Foreign currencies will depreciate against the dollar.
B. The U.S. balance of payments deficit will become worse.
C. U.S. exports will tend to increase.
D. U.S. imports will tend to increase.

- Answer (A) is incorrect because The dollar has depreciated against foreign currencies.
- Answer (B) is incorrect because The U.S. trade balance of payments should improve.
- Answer (C) is correct. The decline in the value of the dollar reduces the prices of U.S. goods to foreigners and will tend to increase exports. Also, foreign goods will be higher priced (in dollars) and imports from foreign countries will tend to decrease, thus helping the U.S. balance of payments.
Answer (D) is incorrect because U.S. imports will decline. Foreign goods will be higher priced than before.

Debt-servicing problems of less developed countries that primarily sell raw materials to the United States would be eased by

A. A recession in the United States with declines in interest rates.
B. An expanding U.S. economy with stable money supply growth.
C. An expansion of the lending authority of the World Bank.
D. A significant increase in the level of U.S. tariffs.

Answer (A) is incorrect because A recession would result in less U.S. demand for raw materials from abroad and a reduction in funds available to the underdeveloped nations to pay debts.
Answer (B) is correct. An expanding U.S. economy would result in greater demand for raw materials from these countries. Also, since the money supply and interest rates are inversely proportional (when the money supply is rising, interest rates are falling), less developed nations could borrow again at lower rates. Moreover, if the money supply is rising, inflation might increase and U.S. dollars would become cheaper, thereby easing the burden of foreign debtors with obligations payable in dollars.
Answer (C) is incorrect because An expansion of lending authority could only increase the debt outstanding and make it less possible for less developed countries to service their debts.
Answer (D) is incorrect because Tariffs would reduce exports to the U.S. and thus the funds available for debt service.

Of the following transactions, the one that would result in worsening the U.S. balance of payments account is the

A. Receipt of dividends by an American corporation from its German subsidiary.
B. Buying of IBM shares by a Kuwaiti investor.
C. U.S. export of military equipment to Saudi Arabia.
D. Expenditure of a U.S. resident vacationing in France.

Answer (A) is incorrect because A transfer of dividends into the U.S. improves the balance of payments.
Answer (B) is incorrect because The purchase of a U.S. financial instrument by a foreigner improves the balance of payments.
Answer (C) is incorrect because The purchase of U.S. goods by a foreign country improves the balance of payments.
Answer (D) is correct. A U.S. resident vacationing abroad transfers money to the foreign country, worsening the U.S. balance of payments and improving that of the other country.

In most recent years, the U.S. balance of payments has registered a deficit. This balance of payments deficit is a measure of the excess of

A. Exports over imports.
B. Imports over exports.
C. Imports, private capital outflows, grants, and remittances over exports and private capital inflows.
D. Goods imports over services imports.

Answer (A) is incorrect because Exports and imports of goods affect only the balance of trade, not the more comprehensive balance of payments.
Answer (B) is incorrect because Exports and imports of goods affect only the balance of trade, not the more comprehensive balance of payments.

Answer (C) is correct. The balance of payments is defined as the excess of imports, private capital outflows, grants, and remittances over exports and private capital inflows. When there is a surplus in the balance of payments, more domestic goods may have been sold abroad than were imported, and/or foreigners may have invested more capital in the domestic country than domestic citizens invested abroad. For this reason, a surplus is considered a favorable balance of payments. Just the opposite is true for a deficit in the balance of payments.

Answer (D) is incorrect because Exports and imports of goods affect only the balance of trade, not the more comprehensive balance of payments.

[931] The U.S. balance of trade is decreased by

A. Foreign investments in the United States.
B. U.S. investments in foreign countries.
C. U.S. exports.
D. U.S. imports.

- Answer (A) is incorrect because Foreign investments in the United States is a factor in the balance of payments but not trade.
- Answer (B) is incorrect because U.S. investments in foreign countries is a factor in the balance of payments but not trade.
- Answer (C) is incorrect because Exports increase the balance of trade.
- Answer (D) is correct. The balance of trade is the difference between imports and exports of goods alone over a given period (the balance of payments is more comprehensive, embracing all transfers made between two countries, including capital movements). A country’s balance of trade is decreased (worsened) by imports.

[932] An appreciation of the U.S. dollar against the Japanese yen would

A. Increase the translated earnings of U.S. subsidiaries domiciled in Japan.
B. Increase the cost of buying supplies for U.S. firms.
C. Make U.S. goods more expensive to Japanese consumers.
D. Make travel in Japan more expensive for U.S. citizens.

- Answer (A) is incorrect because When the earnings of U.S. subsidiaries in Japan are translated into the reporting currency, they will be decreased due to the relative depreciation of the yen.
- Answer (B) is incorrect because An appreciation of the dollar would make it cheaper for U.S. firms to buy supplies.
- Answer (C) is correct. When one currency appreciates, other currencies lose buying power. Thus, if the dollar appreciates against the yen, Japanese customers will find American goods more expensive.
- Answer (D) is incorrect because The increased buying power of the dollar would make travel to Japan less expensive.
A U.S. company took out a 12-month, 4% loan of £10,000 when the spot rate was $2 to £1. At the end of the loan term, the spot rate was $2.10 to £1. What was the company’s effective rate on this loan?

A. 9.20%
B. 5.60%
C. 4.00%
D. 0.95%

Answer (A) is correct. The effective interest rate on a loan denominated in a foreign currency is affected by changes in the exchange rates during the time the loan is outstanding. First, the amount borrowed is stated in terms of the borrowing party’s domestic currency (£10,000 × ($2.00 per £1) = $20,000). The maturity amount of the loan in the foreign currency is then calculated (£10,000 × 1.04 = £10,400). This amount is then converted to the domestic currency at the spot rate in effect on the maturity date (£10,400 × ($2.10 per £1) = $21,840). The difference in the amounts at the two dates is determined ($21,840 − $20,000 = $1,840), and this amount is divided by the face amount of the loan ($1,840 ÷ $20,000 = 9.2%).

Answer (B) is incorrect because this percentage results from reversing the conversion rates for the two currencies.

Answer (C) is incorrect because this percentage is the stated rate of the loan.

Answer (D) is incorrect because this percentage results from reversing the spot rates for the foreign currency.

On September 22, Year 1, Yumi Corp. purchased merchandise from an unaffiliated foreign company for 10,000 units of the foreign company’s local currency. On that date, the spot rate was $.55. Yumi paid the bill in full on March 20, Year 2, when the spot rate was $.65. The spot rate was $.70 on December 31, Year 1. What amount should Yumi report as a foreign currency transaction loss in its income statement for the year ended December 31, Year 1?

A. $0
B. $500
C. $1,000
D. $1,500

Answer (A) is incorrect because a loss resulted when the spot rate increased.

Answer (B) is incorrect because using the spot rates at 12/31/Yr 1 and 3/20/Yr 2 results in $500.

Answer (C) is incorrect because using the spot rates at 9/22/Yr 1 and 3/20/Yr 2 results in $1,000.

Answer (D) is correct. The FASB requires that a receivable or payable denominated in a foreign currency be adjusted to its current exchange rate at each balance sheet date. The resulting gain or loss should ordinarily be reflected in current income. It is the difference between the spot rate on the date the transaction originates and the spot rate at year-end. Thus, the Year 1 transaction loss for Yumi Corp. is $1,500 [10,000 units × ($0.55 − $0.70)].

A gold-mining company expects to sell 10,000 ounces of gold 6 months from today. The revenue risk of selling the gold can be hedged by

A. Selling the gold in the spot market 6 months from today.
B. Buying a gold futures contract for 10,000 ounces today that expires in 6 months.
C. Selling a gold futures contract for 10,000 ounces today that expires in 6 months.
D. Buying a gold futures contract for 5,000 ounces today that expires in 6 months and selling a gold futures contract for 5,000 ounces today that expires in 6 months.
Answer (A) is incorrect because Selling the gold in the spot market 6 months from today will not hedge the revenue risk. The spot rate 6 months from now could be less or more than the spot rate today. The company could potentially lose revenue if the spot rate is less in 6 months. This transaction does not hedge risk.

Answer (B) is incorrect because Buying a gold futures contract for 10,000 ounces today that expires in 6 months will not hedge the revenue risk of selling the gold. By buying a gold futures contract, the company is buying gold at a pre-determined rate. Because it wants to sell gold, not buy it, this hedge would not achieve its objectives.

Answer (C) is correct. Selling a gold futures contract for 10,000 ounces today that expires in 6 months would allow the gold-mining company to lock in a selling price today for the sale of the 10,000 ounces in 6 months when the contract expires. This will hedge the revenue risk as the company pre-determined what it will get for the contract in 6 months.

Answer (D) is incorrect because Buying a gold futures contract for 5,000 ounces today that expires in 6 months and selling a gold futures contract for 5,000 ounces today that expires in 6 months will not effectively hedge the company’s revenue risk. By buying a gold futures contract, the company is buying gold at a pre-determined rate. Because it wants to sell gold, not buy it, this hedge would not achieve its objectives. Even though the company would want to sell a gold futures contract, it would not be for 5,000. By only selling a gold futures contract for 5,000 ounces, it is hedging half its risk.

Suppose that Swiss wrist watches priced in Swiss francs become very popular among U.S. consumers while Britain experiences relatively higher inflation than the United States at the same time. Assuming that all other economic parameters remain constant, which one of the following statements is most accurate?

A. The U.S. dollar will appreciate relative to both the Swiss franc and the British pound.
B. The U.S. dollar will depreciate relative to both the Swiss franc and the British pound.
C. The U.S. dollar will appreciate relative to the Swiss franc and depreciate relative to the British pound.
D. The U.S. dollar will depreciate relative to the Swiss franc and appreciate relative to the British pound.

Answer (A) is incorrect because The Swiss franc is gaining purchasing power with respect to the U.S dollar. Therefore, the Swiss franc is said to have appreciated against the U.S dollar. By the same token, the U.S. dollar is said to have depreciated (lost purchasing power) against the Swiss franc.

Answer (B) is incorrect because Inflation of a currency relative to a second currency causes the first currency to depreciate relative to the second. Because Britain is experiencing higher inflation than the U.S., the British pound depreciates relative to the U.S. dollar. By the same token, the U.S dollar is said to have appreciated against the British pound.

Answer (C) is incorrect because The Swiss franc is gaining purchasing power with respect to the U.S dollar. Therefore, the Swiss franc is said to have appreciated against the U.S dollar. By the same token, the U.S. dollar is said to have depreciated (lost purchasing power) against the Swiss franc. Inflation of a currency relative to a second currency causes the first currency to depreciate relative to the second. Because Britain is experiencing higher inflation than the U.S., the British pound depreciates relative to the U.S. dollar. By the same token, the U.S dollar is said to have appreciated against the British pound.

Answer (D) is correct. The Swiss franc is gaining purchasing power with respect to the U.S dollar. Therefore, the Swiss franc is said to have appreciated against the U.S dollar. By the same token, the U.S. dollar is said to have depreciated (lost purchasing power) against the Swiss franc. Inflation of a currency relative to a second currency causes the first currency to depreciate relative to the second. Because Britain is experiencing higher inflation than the U.S., the British pound depreciates relative to the U.S. dollar. By the same token, the U.S dollar is said to have appreciated against the British pound.

Assuming exchange rates are allowed to fluctuate freely, which one of the following factors would likely cause a nation’s currency to appreciate on the foreign exchange market?

A. A relatively rapid rate of growth in income that stimulates imports.
B. A high rate of inflation relative to other countries.
C. A slower rate of growth in income than in other countries, which causes imports to lag behind exports.
D. Domestic real interest rates that are lower than real interest rates abroad.
Answer (A) is incorrect because an increase in imports drives down the value of the nation’s currency.
Answer (B) is incorrect because a high rate of inflation devalues a nation’s currency.
Answer (C) is correct. Assuming that exchange rates are allowed to fluctuate freely, a nation’s currency will appreciate if the demand for it is constant or increasing while supply is decreasing. For example, if the nation decreases its imports relative to exports, less of its currency will be used to buy foreign currencies for import transactions and more of its currency will be demanded for export transactions. Thus, the supply of the nation’s currency available in foreign currency markets decreases. If the demand for the currency increases or does not change, the result is an increase in (appreciation of) the value of the currency.
Answer (D) is incorrect because lower interest rates relative to those in other countries discourage foreign investment, decreases demand for the nation’s currency, and reduces its value.

The accompanying graph depicts the supply of and demand for U.S. dollars in terms of euros at a point in time, i.e., the euro is the domestic currency. Currently, the equilibrium exchange rate is $1 to €0.65. If inflation of the dollar exceeds that of the euro, the new equilibrium exchange rate would most likely settle at

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Indeterminate</td>
<td>€0.70</td>
</tr>
<tr>
<td>B. Lower than $Q_E$</td>
<td>€0.70</td>
</tr>
<tr>
<td>C. Higher than $Q_E$</td>
<td>€0.60</td>
</tr>
<tr>
<td>D. Indeterminate</td>
<td>€0.60</td>
</tr>
</tbody>
</table>

Answer (A) is incorrect because higher relative inflation in a foreign country results in an increase in purchasing power for the domestic currency, reflected in a new equilibrium price below the old price.
Answer (B) is incorrect because higher relative inflation in a foreign country results in an increase in purchasing power for the domestic currency, reflected in a new equilibrium price below the old price. Also, the new equilibrium quantity could be either higher or lower than the old quantity.
Answer (C) is incorrect because the new equilibrium quantity could be either higher or lower than the old quantity.
Answer (D) is correct. When the rate of inflation in a given country rises relative to the rates of other countries, the demand for that country’s currency falls. This inward shift of the demand curve results from the lowered desirability of that currency, a result of its falling purchasing power. As investors unload this currency, there is more of it available, reflected in an outward shift of the supply curve. A new equilibrium point will be reached at a lower price in terms of investor’s domestic currencies. Also, the new equilibrium quantity could be either higher or lower than the old quantity.
Two countries have flexible exchange rate systems and an active trading relationship. If incomes in Country 1, everything else being equal, then the currency of Country 1 will tend to \( \text{List B} \) relative to the currency of Country 2.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Rise</td>
<td>Remain constant</td>
</tr>
<tr>
<td>B. Fall</td>
<td>Depreciate</td>
</tr>
<tr>
<td>C. Rise</td>
<td>Depreciate</td>
</tr>
<tr>
<td>D. Remain constant</td>
<td>Appreciate</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because If incomes in Country 1 rise, its currency will tend to depreciate relative to the currencies of other countries.
- Answer (B) is incorrect because If incomes in Country 1 fall, its currency will tend to appreciate relative to the currencies of other countries.
- Answer (C) is correct. Citizens with higher incomes look for new consumption opportunities in other countries, driving up the demand for those currencies and shifting the demand curve to the right. Thus, as incomes rise in one country, the prices of foreign currencies rise as well, and the local currency will depreciate.
- Answer (D) is incorrect because If incomes in Country 1 remain constant, its currency will not tend to appreciate or depreciate relative to the currencies of other countries.

Which of the following changes would create pressure for the Japanese yen to appreciate relative to the U.S. dollar?

A. An increase in incomes in Japan.  
B. A change in U.S. tastes in favor of Japanese goods.  
C. A decrease in U.S. incomes.  

- Answer (A) is incorrect because An increase in incomes in Japan would result in increased consumption of imports and increased demand for foreign currencies. The result would be downward pressure on the yen.  
- Answer (B) is correct. Increased demand for Japanese goods in the U.S. would increase the demand for yen, reflected in a rightward shift of the demand curve for yen. U.S. purchasers are willing to pay more for any given quantity of yen.  
- Answer (C) is incorrect because A decrease in U.S. incomes would reduce the demand for imports, which would decrease demand for foreign currencies.  
- Answer (D) is incorrect because An increased demand for U.S. goods in Japan would increase the supply of yen, thereby creating pressure for the yen to depreciate.

A company manufactures goods in Esland for sale to consumers in Woostland. Currently, the economy of Esland is booming and imports are rising rapidly. Woostland is experiencing an economic recession, and its imports are declining. How will the Esland currency, \( \text{SE} \), react with respect to the Woostland currency, \( \text{SW} \)?

A. The \( \text{SE} \) will remain constant with respect to the \( \text{SW} \).  
B. The \( \text{SE} \) will increase with respect to the \( \text{SW} \).  
C. The \( \text{SE} \) will decline with respect to the \( \text{SW} \).  
D. Changes in imports and exports will not affect currency changes.

- Answer (A) is incorrect because The \( \text{SE} \) will depreciate against the \( \text{SW} \).  
- Answer (B) is incorrect because The rise in imports will cause \( \text{SE} \) to depreciate.
Answer (C) is correct. If the growth of a country’s national income is more rapid than other countries’ national income, its currency is likely to depreciate. A country’s imports vary directly with its level of income. As income rises in Esland, Esland consumers purchase more domestic and foreign goods. The greater demand for foreign goods causes a demand for the foreign currency. When demand increases for the foreign currency, its price increases, and Esland’s currency depreciates as a result.

Answer (D) is incorrect because Imports and exports have a substantial effect on currency exchange rates.

[942] If the central bank of a country raises interest rates sharply, the country’s currency will likely

A. Increase in relative value.
B. Remain unchanged in value.
C. Decrease in relative value.
D. Decrease sharply in value at first and then return to its initial value.

Answer (A) is correct. If the interest rates in a given country rise, money will pour in from all over the world in pursuit of that country’s higher returns. This increase in demand for the country’s currency will boost its purchasing power.

Answer (B) is incorrect because A currency tends to increase relative to other currencies when interest rates in the country rise sharply. More investors will want to earn the higher rates of return available in that country.

Answer (C) is incorrect because A currency tends to increase relative to other currencies when interest rates in the country rise sharply. More investors will want to earn the higher rates of return available in that country.

Answer (D) is incorrect because A currency tends to increase relative to other currencies when interest rates in the country rise sharply. More investors will want to earn the higher rates of return available in that country.

[943] Which one of the following statements supports the conclusion that the U.S. dollar has gained purchasing power against the Japanese yen?

A. Inflation has recently been higher in the U.S. than in Japan.
B. The dollar is currently trading at a premium in the forward market with respect to the yen.
C. The yen’s spot rate with respect to the dollar has just fallen.
D. Studies recently published in the financial press have shed doubt on the interest rate parity (IRP) theory.

Answer (A) is incorrect because This statement reflects a loss, not a gain, of purchasing power for the dollar.

Answer (B) is incorrect because No conclusion can be drawn about changes in purchasing power simply from a statement about forward rates.

Answer (C) is correct. If the yen’s spot rate has just fallen, then more yen are required to buy a single dollar. The yen has therefore depreciated, i.e., lost purchasing power. At the same time, the dollar has gained purchasing power.

Answer (D) is incorrect because No conclusion can be drawn about changes in purchasing power simply from evidence for or against the interest rate parity (IRP) theory.

[944] Over the past year, incomes in Russia have risen across the board. Today’s spot rate with respect to the U.S. dollar is $1 = 30 rubles. Which one of the following statements is consistent with these facts?

A. One year ago, $1 could be exchanged for 29 Russian rubles on the spot market.
B. The dollar was selling at a forward premium 1 year ago.
C. Interest rates in the U.S. are higher than those in Russia.
D. Interest rates in the U.S. are lower than those in Russia.
Answer (A) is correct. Citizens with higher incomes look for new consumption opportunities in other countries, driving up the demand for those currencies. Thus, as incomes rise in one country, the prices of foreign currencies rise as well.

Answer (B) is incorrect because a statement about historical forward rates cannot be drawn from the facts supplied.

Answer (C) is incorrect because a statement about comparative interest rates cannot be drawn from the facts supplied.

Answer (D) is incorrect because a statement about comparative interest rates cannot be drawn from the facts supplied.

[945] A fall in the demand for a country’s currency can be caused by any of the following except:

A. A foreign government places restrictions on the importation of the country’s goods.
B. The country’s inflation rate decreases.
C. Interest rates in the country fall.
D. The country’s government raises barriers to the cross-border flow of capital.

Answer (A) is incorrect because if a government places restrictions on the importation of goods from another country, trade between the two countries slows and the demand for the exporting country’s currency falls.

Answer (B) is correct. The currency of a country with a falling inflation rate retains more purchasing power than a currency with high inflation. Demand for a currency with increasing purchasing power will tend to rise.

Answer (C) is incorrect because if the interest rate in a given country falls, investors will move their capital out in order to seek higher returns elsewhere, lowering the demand for the country’s currency.

Answer (D) is incorrect because government-imposed restrictions on the movement of capital lower the demand for the country’s currency.

[946] A shift of the demand curve for a country’s currency to the right could be caused by which of the following?

A. A foreign government placing restrictions on the importation of the country’s goods.
B. A fall in the country’s interest rates.
C. Domestic inflation worsens.
D. A rise in consumer incomes in another country.

Answer (A) is incorrect because a shift to the right would be caused by a foreign government removing, not placing restrictions on the importation of the country’s goods.

Answer (B) is incorrect because a shift to the right would be caused by a rise, not a fall, in the country’s interest rates.

Answer (C) is incorrect because as a country’s inflation rate rises, its currency loses purchasing power and investors move their capital elsewhere, driving demand for the country’s currency down.

Answer (D) is correct. Citizens with higher incomes look for new consumption opportunities in other countries, driving up the demand for those currencies. Thus, as incomes rise in one country, the prices of foreign currencies rise as well.

[947] All of the following are trade-related factors affecting currency exchange rates except:

A. Relative interest rates.
B. Trade barriers.
C. Relative incomes.
D. Relative inflation rates.
● Answer (A) is correct. Relative interest rates is a financial, not a trade-related, factor affecting currency exchange rates.
● Answer (B) is incorrect because Trade barriers is one of the trade-related factors affecting currency exchange rates.
● Answer (C) is incorrect because Relative incomes is one of the trade-related factors affecting currency exchange rates.
● Answer (D) is incorrect because Relative inflation rates is one of the trade-related factors affecting currency exchange rates.

[948] The spot rate for the U.S. dollar is £0.6543, and the 60-day forward rate is £0.6521. The pound is selling at

A. A forward premium with respect to the dollar.
B. A forward discount with respect to the dollar.
C. Interest rate parity with the dollar.
D. International Fisher parity with the dollar.

● Answer (A) is correct. A dollar fetches fewer pounds in the forward market than in the spot market. By the same token, it takes fewer pounds to buy a dollar in the forward market than it does in the spot market. The pound is thus expected to gain purchasing power with respect to the dollar and is therefore selling at a forward premium.
● Answer (B) is incorrect because The pound is trading at a premium, not a discount, with respect to the dollar.
● Answer (C) is incorrect because Interest rate parity cannot be calculated without reference to the interest rates in the two countries.
● Answer (D) is incorrect because Economists do not recognize “international Fisher parity.”

[949] The purchasing-power parity exchange rate

A. Is a fixed (pegged) exchange rate.
B. Is always equal to the market exchange rate.
C. Results in an undervalued currency of countries that are net importers.
D. Holds constant the relative price levels in two countries when measured in a common currency.

● Answer (A) is incorrect because Purchasing-power parity is achieved through floating exchange rates.
● Answer (B) is incorrect because The purchasing-power parity exchange rate is a long-run measure, but the market rate may reflect short-term or medium-term conditions.
● Answer (C) is incorrect because Purchasing-power parity does not affect the valuation of currency.
● Answer (D) is correct. The purchasing-power parity theorem states that, in the long run, the real price of a good in Country A will equal the price of the same good in Country B when the prices are expressed in a common currency and converted at the current exchange rate (adjustments for tariffs, taxes, or transportation cost may need to be made).

[950] The interest-rate parity theorem states that

A. Nominal interest rates decrease when inflation rates increase.
B. The exchange rate is equal to the market exchange rate.
C. A rise in the real interest rate will lead to a depreciation of currency.
D. As nominal foreign interest rates increase, the forward exchange rate in units of the foreign currency per dollar increases.
Answer (A) is incorrect because Nominal interest rates increase when inflation rates are expected to increase.
Answer (B) is incorrect because The interest-rate parity theorem shows the effect on exchange rates of inflation reflected in nominal interest rates.
Answer (C) is incorrect because A rise in the real interest rate will lead to an appreciation of the currency and is not part of the interest-rate parity theorem.
Answer (D) is correct. The interest-rate parity theorem explains the effect on exchange rates of inflation reflected in nominal interest rates. The ratio of the current forward and spot exchange rates (expressed in units of foreign currency per dollar) equals the ratio of one plus the current nominal foreign rate to one plus the current nominal domestic rate. If the current nominal foreign interest rate increases, the forward rate in units of the foreign currency per dollar will increase. Thus, the foreign currency will trade at a discount in the forward market.

[951] The three generally acknowledged theories regarding currency exchange rates suggest all of the following about high-inflation currencies except:

A. They usually trade at large forward discounts.
B. They will weaken over time.
C. Their interest rates will converge over time.
D. Their economies will have high interest rates.

Answer (A) is incorrect because Interest rate parity theory suggests that high-inflation currencies usually trade at large forward discounts.
Answer (B) is incorrect because Purchasing power parity and International Fisher Effect theory suggest that high-inflation currencies will weaken over time.
Answer (C) is correct. The three generally acknowledged theories regarding currency exchange rates do not suggest that interest rates will converge over time.
Answer (D) is incorrect because International Fisher Effect theory suggests that economies with high-inflation currencies will have high interest rates.

[952] If the annual U.S. inflation rate is expected to be 5% while the euro is expected to depreciate against the U.S. dollar by 10%, an Italian firm importing from its U.S. parent can expect its euro costs for these imports to

A. Decrease by about 10%.
B. Decrease by about 5%.
C. Increase by about 5%.
D. Increase by about 16.7%.

Answer (A) is incorrect because The euro’s loss of purchasing power through depreciation against the dollar outweighs the dollar’s loss of purchasing power against all other currencies due to inflation. Thus, euro costs will increase, not decrease.
Answer (B) is incorrect because The euro’s loss of purchasing power through depreciation against the dollar outweighs the dollar’s loss of purchasing power against all other currencies due to inflation. Thus, euro costs will increase, not decrease.
Answer (C) is incorrect because This percentage is the difference between the currency depreciation and the inflation rate.
Answer (D) is correct. Inflation in the U.S. means that $1.05 now has the purchasing power formerly enjoyed by $1.00. The 10% depreciation of the euro means that its purchasing power in dollars has declined to 90%. Dividing the U.S. inflation factor of 1.05 by the new euro value of .90 and subtracting 1 results in a net loss of euro purchasing power against the dollar of 16.67%. 
If the annual U.S. inflation rate is expected to be 3%, and the Ptomanian ptoma is expected to depreciate against the U.S. dollar by 12%, a Ptomanian firm importing from its U.S. parent can expect the ptoma costs of imports denominated in dollars to

A. Decrease by about 12%.
B. Decrease by about 5%.
C. Increase by about 3%.
D. Increase by about 17%.

- Answer (A) is incorrect because Prices paid by the Ptomanian buyer will increase. It must adjust payments in ptomas upward for both U.S. inflation and Ptomanian monetary depreciation.
- Answer (B) is incorrect because Prices paid by the Ptomanian buyer will increase. It must adjust payments in ptomas upward for both U.S. inflation and Ptomanian monetary depreciation.
- Answer (C) is incorrect because Prices will increase by 3% simply as a result of inflation. This answer disregards the effect of the currency depreciation.
- Answer (D) is correct. Inflation in the U.S. means that $1.03 now has the purchasing power formerly enjoyed by $1.00. The 12% depreciation of the ptoma means that its purchasing power in dollars has declined to 88%. Dividing the U.S. inflation factor of 1.03 by the new ptoma value of .88 and subtracting 1 results in a net loss of ptoma purchasing power against the dollar of 17.05%.

Consider a world consisting of only two countries, Canada and Ruritania. Inflation in Canada in 1 year was 5%, and in Ruritania 10%. Which one of the following statements about the Canadian exchange rate (rounded) during that year will be true?

A. Inflation has no effect on the exchange rates.
B. The Canadian dollar will appreciate by 5%.
C. The Canadian dollar will depreciate by 5%.
D. The Canadian dollar will depreciate by 15%.

- Answer (A) is incorrect because Inflation affects exchange rates by diminishing a currency's purchasing power.
- Answer (B) is correct. Ruritanian inflation is worse than Canadian inflation, so the Canadian dollar will experience a net appreciation. Dividing the Ruritanian inflation factor of 1.10 by the Canadian factor of 1.05 and subtracting 1 results in a net gain of Canadian purchasing power of 4.76%.
- Answer (C) is incorrect because Ruritanian inflation is worse than Canadian inflation, so the Canadian dollar will experience a net appreciation.
- Answer (D) is incorrect because Ruritanian inflation is worse than Canadian inflation, so the Canadian dollar will experience a net appreciation.
Caroline Brown, the product manager for a U.S. computer manufacturer, is being asked to quote prices of desktop computers to be used in Kuwait. The Kuwaiti government wants the price in British pounds, for delivery next year. Brown knows that the general price level in the United States will increase by 3%. Her banker forecasts that the British pound will depreciate about 5% this year with respect to the U.S. dollar. If Brown is able to quote £700 for immediate delivery, the price that should be quoted for delivery to Kuwait next year is about

A. £737
B. £721
C. £759
D. £700

- Answer (A) is incorrect because the amount of £737 results from considering only the effect of the 5% decline in the pound.
- Answer (B) is incorrect because the amount of £721 results from considering only the effect of the 3% U.S. inflation rate.
- Answer (C) is correct. Expected inflation in the U.S. means that it will take $1.03 to have the same purchasing power currently enjoyed by $1.00. At the same time, the pound is expected to fall to 95% of its current value against the dollar. The net effect is a loss of purchasing power for the pound against the dollar of 8.42% \((1.03 \div .95) - 1.0\). Next year’s price will therefore be £758.94 ( £700 \times 1.0842).
- Answer (D) is incorrect because the effects of both the 3% U.S. inflation rate and the 5% decline in the pound must be considered.

An American importer of English clothing has contracted to pay an amount fixed in British pounds 3 months from now. If the importer worries that the U.S. dollar may depreciate sharply against the British pound in the interim, it would be well advised to

A. Buy pounds in the forward exchange market.
B. Sell pounds in the forward exchange market.
C. Buy dollars in the futures market.
D. Sell dollars in the futures market.

- Answer (A) is correct. The American importer should buy pounds now. If the dollar depreciates against the pound in the next 90 days, the gain on the forward exchange contract would offset the loss from having to pay more dollars to satisfy the liability.
- Answer (B) is incorrect because selling pounds would compound the risk of loss for someone who has incurred a liability. However, it would be an appropriate hedge of a receivable denominated in pounds.
- Answer (C) is incorrect because the importer needs pounds, not dollars.
- Answer (D) is incorrect because although buying pounds might be equivalent to selling dollars for pounds, this is not the best answer. This choice does not state what is received for the dollars.

If risk is purposely undertaken in the foreign currency market, the investor in foreign currency then becomes

A. A speculator.
B. An arbitrageur.
C. Involved in hedging.
D. An exporter.

- Answer (A) is correct. An individual who purposely accepts exchange rate risk is a speculator. Speculators buy and sell foreign currencies in anticipation of favorable changes in rates.
Answer (B) is incorrect because an arbitrageur is someone who simultaneously buys foreign currency in one market and sells in another market at a slightly higher price. Thus, the arbitrageur’s risk is slight.

Answer (C) is incorrect because hedging avoids the risk of foreign currency transactions for those who do not seek to gain from fluctuations in exchange rates. Hedging is the sale or purchase of a forward exchange contract to offset a possible exchange rate loss. When a forward exchange contract is intended and is effective as an economic hedge against an exposed net asset or net liability position (e.g., an outstanding receivable or liability denominated in a foreign currency), any exchange gain or loss on the forward contract will offset any exchange gain or loss on the exposed net asset or net liability position. Thus, no exchange gain or loss will result.

Answer (D) is incorrect because exporters and importers are likely to engage in hedging to avoid exchange rate risk.

A company has a foreign-currency-denominated trade payable, due in 60 days. In order to eliminate the foreign currency exchange-rate risk associated with the payable, the company could

A. Sell foreign currency forward today.
B. Wait 60 days and pay the invoice by purchasing foreign currency in the spot market at that time.
C. Buy foreign currency forward today.
D. Borrow foreign currency today, convert it to domestic currency on the spot market, and invest the funds in a domestic bank deposit until the invoice payment date.

Answer (A) is incorrect because a forward market sale of foreign currency is appropriate to hedge a receivable denominated in a foreign currency.

Answer (B) is incorrect because waiting to buy the currency in 60 days does not eliminate the risk of an adverse exchange-rate movement.

Answer (C) is correct. The company can arrange to purchase the foreign currency today rather than in 60 days by buying the currency in the forward market. This hedging transaction will eliminate the exchange-rate risk associated with the trade payable.

Answer (D) is incorrect because this strategy would be comparable to a future sale of the foreign currency at a rate known today, which would not provide the currency needed to pay the invoice. However, the opposite strategy would be an effective money market hedge. If the company converted domestic currency to foreign currency in the spot market today and invested in a foreign bank deposit or treasury bill, it could then use the proceeds from the foreign investment to pay the invoice in 60 days.

When the U.S. dollar is expected to rise in value against foreign currencies, a U.S. company with foreign currency denominated receivables and payables should

A. Slow down collections and speed up payments.
B. Slow down collections and slow down payments.
C. Speed up collections and speed up payments.
D. Speed up collections and slow down payments.

Answer (A) is incorrect because this would raise the real cost to the company.

Answer (B) is incorrect because this would not maximize the amount of U.S. dollars the company will have.

Answer (C) is incorrect because this would not maximize the amount of U.S. dollars the company will have.

Answer (D) is correct. The proper action would be to increase collections and decrease payments. Collections should be made quickly and converted into dollars to sustain the increase in their value as the dollar appreciates. Decreasing payments would be profitable because, as the company exchanges dollars for foreign currency at a later date, it will receive more of the foreign currency, thus lowering its real cost.
A short-term speculative rise in the world-wide value of domestic currency could be moderated by a central bank decision to

A. Sell domestic currency in the foreign exchange market.
B. Buy domestic currency in the foreign exchange market.
C. Sell foreign currency in the foreign exchange market.
D. Increase domestic interest rates.

- Answer (A) is correct. In the short run, a central bank’s sale of the currency increases the supply and reduces the price of the currency. In the long run, given the current system of managed floating exchange rates, changes in rates should reflect changes in economic conditions. In other words, exchange rates should float. But central banks are expected to manage the float by buying and selling currencies to counteract the disruptive effects on rates of such temporary factors as speculation.
- Answer (B) is incorrect because Buying domestic currency in the foreign exchange market would raise the world-wide value of the domestic currency.
- Answer (C) is incorrect because Selling foreign currency would raise the world-wide value of the domestic currency with respect to that foreign currency.
- Answer (D) is incorrect because A central bank decision to increase domestic interest rates would make the domestic currency attractive to foreign investors, and raise the value of the domestic currency.

Bonner Electronics has subsidiaries in several international locations and is concerned about its exposure to foreign exchange risk. In countries where currency values are likely to fall, Bonner should encourage all of the following policies except

A. Granting trade credit whenever possible.
B. Investing excess cash in inventory or other real assets.
C. Purchasing materials and supplies on a trade credit basis.
D. Borrowing local currency funds if an appropriate interest rate can be obtained.

- Answer (A) is correct. Extension of credit in a foreign currency would result in receiving payment in less valuable dollars if the foreign currency became less valuable. Thus one would not want to encourage granting trade credit in a foreign country when the country’s currency is expected to lose value.
- Answer (B) is incorrect because Investing monetary assets into nonmonetary assets is advantageous when the monetary unit is going to lose value.
- Answer (C) is incorrect because It is advantageous to become a debtor when the monetary unit is losing value.
- Answer (D) is incorrect because It is advantageous to become a debtor when the monetary unit is losing value.

A U.S. company has an account payable it must pay in 6 months with one Japanese company and an account receivable to be received in 6 months with another Japanese company. The U.S. company would not have transaction exposure if

A. Both the account payable and account receivable are denominated in U.S. dollars.
B. Both the account payable and the account receivable are denominated in Japanese yen and the yen account receivable is greater than the yen account payable.
C. Both the account payable and the account receivable are denominated in Japanese yen and the yen account receivable is less than the yen account payable.
D. The account payable is denominated in dollars and the account receivable is denominated in yen.
Answer (A) is correct. This is the only listed answer choice that completely avoids exchange rate fluctuation risks.

Answer (B) is incorrect because the downside risk to a foreign-denominated receivable is that the foreign currency might depreciate against the firm’s domestic currency. The downside risk to a foreign-denominated payable is that the foreign currency might appreciate against the firm’s domestic currency. Although both the receivable and the payable are denominated in the yen, the net amount still has to be exchanged back to U.S. dollars and faces the risks stated above.

Answer (C) is incorrect because the downside risk to a foreign-denominated receivable is that the foreign currency might depreciate against the firm’s domestic currency. The downside risk to a foreign-denominated payable is that the foreign currency might appreciate against the firm’s domestic currency. Although both the receivable and the payable are denominated in the yen, the net amount still has to be exchanged back to U.S. dollars and faces the risks stated above.

Answer (D) is incorrect because the downside risk to a foreign-denominated receivable is that the foreign currency might depreciate against the firm’s domestic currency.

All of the following are valid reasons for expansion of international business by U.S. multinational corporations, except to

A. Secure new sources for raw materials.
B. Find additional areas where their products can be successfully marketed.
C. Minimize their costs of production.
D. Protect their domestic market from competition from foreign manufacturers.

Answer (A) is incorrect because securing new sources of raw materials is one of the sound cost-related reasons firms have for international business expansion.

Answer (B) is incorrect because seeking new markets is one of the sound revenue-related reasons firms have for international business expansion.

Answer (C) is incorrect because attempting to minimize the costs of production is one of the sound cost-related reasons firms have for international business expansion.

Answer (D) is correct. Reasons for international business expansion, known as direct foreign investment, can be both revenue-oriented (seeking new markets or avoiding trade restrictions) and cost-oriented (seeking cheaper inputs or favorable exchange rates). An attempt to protect the firm’s domestic market from foreign competition by expanding operations into foreign countries is unlikely.

Which one of the following statements concerning American Depository Receipts (ADRs) is false?

A. ADRs facilitate the banking procedures for U.S. multinational firms.
B. ADRs allow Americans to invest abroad.
C. ADRs allow foreigners to raise capital in the U.S.
D. ADRs are securities issued by American banks acting as custodians of shares of foreign firms.

Answer (A) is correct. Ownership rights in foreign corporations are sometimes evidenced by American Depository Receipts (ADRs). The foreign stocks are deposited with a large U.S. bank, which in turn issues ADRs representing ownership in the foreign shares. The ADR shares then trade on a U.S. stock exchange, whereas the company’s original shares trade in foreign stock markets. ADRs allow foreign companies to develop a U.S. shareholder base without being subject to many SEC restrictions.

Answer (B) is incorrect because the purpose of an ADR is to allow Americans to invest abroad.

Answer (C) is incorrect because ADRs are designed to allow foreign firms to raise capital in the U.S.

Answer (D) is incorrect because ADRs are securities issued by American banks acting as custodians of shares of foreign firms.
A British company currently has domestic operations only. It plans to invest equal amounts of money on projects either in the U.S. or in China. The company will select the country based on risk and return for its portfolio of domestic and international projects taken together. The risk reduction benefits of investing internationally (based on 50% of British domestic operations and 50% foreign operations) will be the greatest when there is perfectly positive correlation between the British return and the U.S. return. A. Positive correlation between the British return and the U.S. return. B. Negative correlation between the U.S. return and the Chinese return. C. Positive correlation between the U.S. return and the Chinese return. D. Negative correlation between the Chinese return and the British return.

- Answer (A) is incorrect because a positive correlation between the foreign investment and domestic operations will increase risk, not reduce it.
- Answer (B) is incorrect because the correlation between the U.S. investment and the Chinese investment is irrelevant; the investment must be in one or the other of those two countries.
- Answer (C) is incorrect because the relevant correlation is one between the domestic (British) operations and one of the two alternatives.
- Answer (D) is correct. Portfolio theory concerns the composition of an investment portfolio that is efficient in balancing the risk with the rate of return of the portfolio. Diversification reduces risk. This firm’s goal is to balance the risk inherent in having 100% of its operations in Britain. This will be accomplished when the foreign investment moves in the opposite direction from the domestic (British) operations.

Direct foreign investment allows firms to avoid exposure to political risk. A. The cost of exchange rate fluctuations. B. Trade restrictions imposed on foreign companies in the customers’ market. C. Domestic regulations on the use of foreign technology. D. Answer (A) is incorrect because direct foreign investment increases exposure to political risk.

- Answer (B) is incorrect because direct foreign investment increases exposure to exchange rate risk.
- Answer (C) is correct. Reasons for international business expansion, known as direct foreign investment, can be both revenue-oriented (seeking new markets or avoiding trade restrictions) and cost-oriented (seeking cheaper inputs or favorable exchange rates).
- Answer (D) is incorrect because a multinational company is subject to its home country’s regulations on the use of foreign technology.

Technocrat, Inc., located in Belgium currently manufactures products at its domestic plant and exports them to the U.S. since it is less expensive to produce at home. The company is considering the possibility of setting up a plant in the U.S. All of the following factors would encourage the company to consider direct foreign investment in the U.S. except the

A. Expectation of more stringent trade restrictions by the U.S. B. Depreciation of the U.S. dollar against Belgium’s currency. C. Widening the gap in production costs between the United States and Belgium locations. D. Changing demand for the company’s exports to the U.S. due to exchange rate fluctuations.
Answer (A) is incorrect because Avoiding trade restrictions is one of the sound revenue-related reasons firms have for international business expansion.

Answer (B) is incorrect because If the foreign currency depreciates against the home country’s currency, operations in the foreign country are made even less expensive.

Answer (C) is correct. Production costs in the home country are already lower than those in the U.S. Widening this gap would not serve the firm’s interests.

Answer (D) is incorrect because Avoiding exchange rate risk is one of the sound cost-related reasons for international business expansion.

[968] All of the following are concerns that are unique to foreign investments except

A. Exchange rate changes.
B. Purchasing power parity.
C. Changes in interest rates.
D. Expropriation.

- Answer (A) is incorrect because Changes in the exchange rates of currencies are an inherent aspect of doing business in foreign countries.
- Answer (B) is incorrect because The purchasing power parity theorem is an explanatory mechanism for the setting of long-term exchange rates between currencies.
- Answer (C) is correct. Interest rates are an aspect of doing business within any modern economy. They are not unique to foreign investment.
- Answer (D) is incorrect because The risk of expropriation by a foreign government is an inherent risk of doing business internationally.

[969] The cost of capital for foreign investment projects is higher because of all of the following factors except

A. Exchange-rate risk.
B. Political risk arising from possible expropriation.
C. Laws requiring specific forms of financing.
D. Trigger pricing.

- Answer (A) is incorrect because They are all causes of higher costs of capital in foreign projects.
- Answer (B) is incorrect because They are all causes of higher costs of capital in foreign projects.
- Answer (C) is incorrect because They are all causes of higher costs of capital in foreign projects.
- Answer (D) is correct. The cost of capital is typically higher for foreign projects for a variety of reasons, including exchange-rate risk, political risk, and limitations on sources of financing that often require a certain percentage of domestic ownership. Trigger pricing is not a cause. Trigger pricing is a means of managing exchange-rate risk by supplying foreign funds at an indexed price, but with an option to convert to a futures-based fixed price when a specified basis differential exists between the two prices.
Which of the following is not a political risk of investing in a foreign country?

A. Rebellions could result in destruction of property.
B. Assets could be expropriated.
C. Foreign-exchange controls could limit the repatriation of profits.
D. A foreign customer might default on its debt.

- Answer (A) is incorrect because These are all political risks.
- Answer (B) is incorrect because These are all political risks.
- Answer (C) is incorrect because These are all political risks.
- Answer (D) is correct. Political risks include the threat of expropriation of company assets, destruction of assets in rebellions in third-world nations, and limitations on the repatriation of profits (or even initial investments). Default by a foreign customer is not a political risk, but a risk of doing business either locally or internationally.

The benefits of direct foreign investment by multinational corporations include all of the following except

A. Easier access to scarce resources.
B. Improved earnings opportunities.
C. Improved international understanding.
D. More expropriation opportunities.

- Answer (A) is incorrect because They are all benefits of international investment.
- Answer (B) is incorrect because They are all benefits of international investment.
- Answer (C) is incorrect because They are all benefits of international investment.
- Answer (D) is correct. Benefits include easier access to scarce resources, improved earnings opportunities, and improved international understanding. Expropriation is not a benefit. It is the risk that a foreign government will nationalize a company’s assets.

Which of the following is a benefit to the home country of international diversification by multinational companies?

A. A better international monetary system.
B. Jobs may be lost to foreign subsidiaries.
C. Unions may be weakened.
D. Reduced flexiblity of operation in a foreign political system.

- Answer (A) is correct. A better international monetary system, because of greater participation by many users, is a benefit of international diversification.
- Answer (B) is incorrect because Losing jobs to a foreign subsidiary is a disadvantage to the host country.
- Answer (C) is incorrect because The weakening of domestic unions is considered a disadvantage.
- Answer (D) is incorrect because The inflexibility of dealing with foreign political regimes is a disadvantage.
The most likely benefit of a multinational company to its home country is

A. The competitive advantage of the multinational over its domestic rivals.
B. Access to resources.
C. New capital investment.
D. Remittance of profits outside the home country.

- Answer (A) is incorrect because the competitive advantage of the multinational over its domestic rivals is an adverse effect on the home country.
- Answer (B) is correct. Benefits to the home country include (1) improved earnings and exports of products to foreign subsidiaries; (2) improved ability to obtain scarce resources; and (3) the typical benefits of free trade, i.e., greater product availability, a better international monetary system, and improved international understanding.
- Answer (C) is incorrect because new capital investment is a benefit to the host country.
- Answer (D) is incorrect because profits are remitted to the home country from the host country.

The most likely benefit of a multinational company to its host country is

A. Net capital outflow.
B. Formation of cartels.
C. Increased tax revenues.
D. Establishment of transfer prices to minimize taxes.

- Answer (A) is incorrect because remittance of royalties, dividends, and profits can result in a net capital outflow, an adverse effect.
- Answer (B) is incorrect because formation of cartels (international monopolies) has an anticompetitive effect.
- Answer (C) is correct. Benefits to the host country include (1) new investment of capital, technology, and management abilities; (2) improvements in output and efficiency along with the resulting stronger balance of payments; and (3) stimulation of competition, increased tax revenues, and a higher standard of living.
- Answer (D) is incorrect because the multinational may charge economically unreasonable transfer prices. The purpose is to earn profits where (1) taxes are lowest, or (2) the capital outflow restrictions are weakest.

The most likely adverse effect on a multinational’s home country is

A. Flow of royalties and dividends out of the home country.
B. Manipulation of transfer prices.
C. Loss of technology.
D. Loss of tax revenues.

- Answer (A) is incorrect because net capital outflow is more likely to be an adverse effect on the host.
- Answer (B) is incorrect because manipulation of transfer prices is more likely to be an adverse effect on the host. The result is establishment of economically unreasonable transfer prices among subsidiaries so that profits will be earned where taxes are lowest or restrictions on the export of profits are least stringent.
- Answer (C) is incorrect because a benefit to the host is investment in new technology.
- Answer (D) is correct. Adverse effects on the home country include (1) loss of jobs and tax revenues, (2) instability caused by reduced flexibility of operation in a foreign political system, (3) the risk of expropriation, and (4) the competitive advantage of multinationals over domestic rivals.
Which of the following is not a method of financing international trade?

A. Forfaiting.
B. Cross-border factoring.
C. American depository receipts (ADRs).
D. Banker’s acceptances.

- Answer (A) is incorrect because Forfaiting is a form of factoring of medium- and long-term receivables.
- Answer (B) is incorrect because Cross-border factoring is a means of financing using factors in two different countries.
- Answer (C) is correct. Forfaiting is a means of financing international trade, as are cross-border factoring and banker’s acceptances. ADRs are ownership rights in foreign corporations.
- Answer (D) is incorrect because Banker’s acceptances are a common means of financing international trade.

For an American investor who wants to avoid legal restrictions on investing in equity securities of foreign companies, the most frequent means of making indirect investments is through the purchase of

A. Letters of credit.
B. Banker’s acceptances.
C. American depository receipts.
D. Global depository receipts.

- Answer (A) is incorrect because A letter of credit is a means of financing international trade. Letters of credit do not represent equity ownership.
- Answer (B) is incorrect because Banker’s acceptances are a means of financing international trade and do not represent equity ownership.
- Answer (C) is correct. American depository receipts (ADRs) are ownership rights in foreign corporations.
- Answer (D) is incorrect because Global depository receipts is a nonsense term.

A letter of credit is a(n)

A. Letter documenting a line of credit on which a customer may draw at its bank.
B. Engagement by a financial institution to pay drafts or other demands for payment for its customer.
C. Letter by a buyer or seller of goods that credit is due the other party for defective or returned goods.
D. Credit reference given by a bank.

- Answer (A) is incorrect because It describes a credit on which a customer may borrow from a bank.
- Answer (B) is correct. A letter of credit is a definite undertaking by an issuer (such as a bank) to a beneficiary (such as a seller) at the request or for the account of an applicant (such as a buyer who is a customer of the bank) to honor a documentary presentation by payment or delivery of an item of value. The holder of a letter of credit merely needs to present the required drafts or other documents (usually documenting a sale of goods to the issuer’s customer) and to receive payment from the bank or other issuer up to the limit specified.
- Answer (C) is incorrect because It describes a credit memorandum. At the end of some agreed period, such memoranda are netted with invoices to determine what is due.
- Answer (D) is incorrect because A credit reference is a statement concerning the creditworthiness of a person.
A seller is paid in a bill of lading and letter of credit transaction when the bill of lading is given to the

A. Transport company.
B. Buyer.
C. Seller’s bank.
D. Correspondent bank.

- Answer (A) is incorrect because the bill of lading is issued to the seller when (s)he delivers the purchased goods to the transporting company.
- Answer (B) is incorrect because the buyer receives the bill of lading after the seller is paid. The buyer does not pay the seller.
- Answer (C) is incorrect because the buyer’s bank, not the seller’s, receives the bill of lading.
- Answer (D) is correct. The letter of credit and bill of lading transaction is used to assure that the seller will be paid. After the seller and buyer enter into an agreement for the sale of goods, the buyer arranges with a bank or other issuer to obtain a letter of credit. The buyer’s bank arranges for a bank in the seller’s city or country (the correspondent) to issue or confirm the letter of credit to the seller. The seller draws on the letter of credit by writing drafts. The seller is paid when the bill of lading is presented to the correspondent bank.

Which method of payment in an international trade transaction requires payment whenever an instrument is presented?

A. Consignment.
B. Time draft.
C. Sight draft.
D. Trade acceptance.

- Answer (A) is incorrect because in a consignment, the seller-exporter delivers (consigns) goods to the importer-consignee for sale to third parties. The consignee pays the consignor only when goods are sold.
- Answer (B) is incorrect because if the draft is a time draft (also called a trade acceptance), it will be payable at a specific future time. The time draft is returned to the exporter who may present the draft for payment when due or use it as collateral for a loan.
- Answer (C) is correct. A sight draft, also known as a demand draft, is a draft ordering payment on sight, i.e., when presented for payment. It is sent to the importer’s bank with the shipping documents. After the draft is signed by the importer, the bank charges the importer’s account and remits the money to the exporter.
- Answer (D) is incorrect because a trade acceptance is payable at a specific future time, not on sight (demand).

Commercial drafts are common in international business transactions. Such a draft

A. Is a two-party instrument.
B. Is payable to the importer.
C. Contains an order to the drawee.
D. Contains an order by the importer.

- Answer (A) is incorrect because any draft is a three-party instrument (drawer, drawee, and payee).
- Answer (B) is incorrect because the draft is payable to the seller-exporter, who is also the drawer.
Answer (C) is correct. Commercial drafts are commonly used in international business transactions. Such drafts are three-party instruments: The seller-exporter is the drawer and payee, and the buyer-importer is the drawee. A draft contains an order by the drawer to the drawee to pay a fixed amount of money to the payee.

Answer (D) is incorrect because The drawer (seller-exporter) orders the drawee (buyer-importer) to pay the payee (seller-exporter).

[982] From the seller’s perspective, what is the most risky form of payment used in international trade?

A. Letter of credit.
B. Open account.
C. Sight draft.
D. Time draft.

- Answer (A) is incorrect because A letter of credit issued by a bank assures payment to a seller.
- Answer (B) is correct. A sale on open-account is risky because the exporter merely ships the goods to the importer, who signs an invoice acknowledging receipt. Thus, the exporter is not assured of payment if the importer defaults. Such an arrangement is most likely if the parties have previously transacted business.
- Answer (C) is incorrect because A draft may be negotiated for value to a third party or presented for payment.
- Answer (D) is incorrect because A draft may be negotiated for value to a third party or presented for payment.

[983] From the seller’s perspective, the least risky form of payment in international trade is

A. Open account.
B. Letter of credit.
C. Prepayment.
D. Trade acceptance.

- Answer (A) is incorrect because Payment on an open account is the riskiest method.
- Answer (B) is incorrect because A letter of credit is subject to the risk that discrepancies in the presentation to the issuing bank may cause nonpayment.
- Answer (C) is correct. Under a prepayment arrangement, the exporter will not ship the goods until the buyer has wired payment into the exporter’s bank account. First-time buyers of unknown creditworthiness and buyers in financially troubled countries are often required to prepay. Established buyers are rarely willing to assume the risk that comes with prepayment.
- Answer (D) is incorrect because Payment at a specific future time is riskier than payment already received.

[984] An exporter delivers goods to a retailer for sale to the public. If the exporter is paid only after sale to third parties, the arrangement is a(n)

A. Consignment.
B. Trade acceptance.
C. Sale on open account.
D. Form of countertrade.

- Answer (A) is correct. In a consignment, the seller-exporter delivers (consigns) goods to the importer-consignee for sale to third parties. The consignee pays the consignor only when goods are sold.
Answer (B) is incorrect because A trade acceptance is a time draft.
Answer (C) is incorrect because A sale on open account is directly to a purchaser. A consignee is not a purchaser.
Answer (D) is incorrect because An exchange of goods has not occurred.

[985] The method of financing international trade that necessarily involves sale of medium- to long-term receivables is

A. Forfaiting.
B. Countertrade.
C. Cross-border factoring.
D. A banker’s acceptance.

Answer (A) is correct. Forfaiting is a form of factoring. It involves the sale by exporters of large, medium- to long-term receivables to buyers (forfaiters) who are willing and able to bear the costs and risks of credit and collections.
Answer (B) is incorrect because Countertrade at its simplest is barter -- the exchange of goods or services for other goods or services rather than merely for cash.
Answer (C) is incorrect because Cross-border factoring is a method of consummating a transaction by a network of factors across borders. The exporter’s factor contacts correspondent factors in other countries to assist in the collection of accounts receivable.
Answer (D) is incorrect because A banker’s acceptance is a time draft drawn on deposits in a bank.

[986] A banker’s acceptance is

A. A form of sight (demand) draft.
B. Created by a bank.
C. Sold at a premium in a primary market.
D. Guaranteed by a bank.

Answer (A) is incorrect because A banker’s acceptance is a time draft.
Answer (B) is incorrect because A banker’s acceptance is created by a nonfinancial firm.
Answer (C) is incorrect because A banker’s acceptance is sold at a discount in a secondary market.
Answer (D) is correct. Banker’s acceptances are time drafts drawn on deposits in a bank. They are short-term credit investments created by a nonfinancial firm and guaranteed (accepted) by a bank as to payment. Acceptances are traded at discounts in secondary markets. These instruments have been a popular investment for money market funds.

[987] Which of the following is a form of barter?

A. Forfaiting.
B. Countertrade.
C. Cross-border factoring.
D. Consignment.

Answer (A) is incorrect because Forfaiting is a form of factoring. It involves the sale by exporters of large, medium- to long-term receivables to buyers (forfaiters) who are willing and able to bear the costs and risks of credit and collections.
Answer (B) is correct. Countertrade at its simplest is barter -- the exchange of goods or services for other goods or services rather than merely for cash.

Answer (C) is incorrect because Cross-border factoring is a method of consummating a transaction by a network of factors across borders. The exporter’s factor contacts correspondent factors in other countries to assist in the collection of accounts receivable.

Answer (D) is incorrect because In a consignment, the seller-exporter delivers (consigns) goods to the importer-consignee for sale to third parties. The consignee pays the consignor only when goods are sold.

Cross-border factoring involves

A. Using a network of factors in other countries.
B. Bartering goods and services with factors in other countries.
C. Sale by exporters of long-term receivables to factors in other countries.
D. Consignment to factors in other countries.

Answer (A) is correct. A factor purchases receivables and assumes collection risk. Cross-border factoring is a method of consummating a transaction by a network of factors across borders. The exporter’s factor contacts correspondent factors in other countries to assist in the collection of accounts receivable.

Answer (B) is incorrect because Countertrade involves barter.

Answer (C) is incorrect because Forfaiting is a form of factoring. It involves the sale by exporters of large, medium- to long-term receivables to buyers (forfaiters) who are willing and able to bear the costs and risks of credit and collections.

Answer (D) is incorrect because If the draft is a time draft (also called a trade acceptance), it will be payable at a specific future time. The time draft is returned to the exporter who may present the draft for payment when due or use it as collateral for a loan.

XCo is an American company that wants to sell widgets to DCo, a Danish Corporation. XCo is unsure about DCo’s ability to pay. XCo should

A. Not transact business with DCo.
B. Transact business with DCo because American law requires DCo to pay.
C. Transact business with DCo because Danish law requires DCo to pay.
D. Require DCo to obtain a letter of credit.

Answer (A) is incorrect because XCo may find it profitable to transact business with DCo, but requiring a letter of credit may be preferable to relying on litigation in the event of a breach.

Answer (B) is incorrect because XCo may find it profitable to transact business with DCo, but requiring a letter of credit may be preferable to relying on litigation in the event of a breach.

Answer (C) is incorrect because XCo may find it profitable to transact business with DCo, but requiring a letter of credit may be preferable to relying on litigation in the event of a breach.

Answer (D) is correct. If a U.S. company sells goods to a foreign company, the U.S. company may not know whether the foreign company will pay the contract price, is solvent, or whether it will reject a delivery of the goods. Requiring a letter of credit addresses the problem. A letter of credit is an engagement by the issuing bank (DCo’s bank in Denmark) to pay on behalf of its customer when the requirements of the letter of credit are complied with. When the beneficiary (XCo) is in another country, the letter of credit is often sent to a confirming bank (in the U.S. in this case), which will pay the beneficiary directly upon presentation of a document of title. The confirming bank will then be paid by the issuing bank.
Which of the following is false concerning a bill of lading?

A. It is a receipt showing that a seller transferred possession of goods to a shipper.
B. It is a contract under which the shipper agrees to transport goods to the buyer.
C. It is an engagement by a bank or other person made at the customer’s request to pay drafts or other demands for its customer.
D. It shows who has ownership of the goods.

- Answer (A) is incorrect because it is a true statement about a bill of lading.
- Answer (B) is incorrect because it is a true statement about a bill of lading.
- Answer (C) is correct.
- Answer (D) is incorrect because it is a true statement about a bill of lading.

Which of the following statements is true with respect to international transfer pricing by a U.S. firm?

A. Transfer prices charged to foreign subsidiaries must be the same as those charged to domestic subsidiaries.
B. The existence of tariffs in the foreign country may necessitate a higher transfer price be charged a foreign subsidiary.
C. Limitations on taking profits out of a foreign country can be avoided by charging the foreign subsidiary a higher transfer price.
D. The transfer price must consider the Internal Revenue Code limitation that the amount of taxable income that can be claimed by a foreign subsidiary can be no more than 25% of the total (parent plus subsidiary) taxable income.

- Answer (A) is incorrect because transfer prices charged to foreign subsidiaries are often quite different from those charged domestic subsidiaries.
- Answer (B) is incorrect because the existence of tariffs in the foreign country would necessitate that a lower transfer price be charged to avoid a high tariff.
- Answer (C) is correct.
- Answer (D) is incorrect because the tax laws limit the profit of foreign subsidiaries to 50% of the total.

A firm ships its product to a foreign subsidiary and charges a price that may increase import duties but lower the income taxes paid by the subsidiary. The most likely reason for these effects is that the

A. Price is an arm’s-length price.
B. Price is a cost-plus price.
C. Transfer price is too low.
D. Transfer price is too high.

- Answer (A) is incorrect because an arm’s-length price is what a competitor would charge in that market.
- Answer (B) is incorrect because a cost-plus price does not necessarily trigger higher import duties.
Answer (C) is incorrect because if the transfer price is too low, import duties would be lower and taxes would be higher.

Answer (D) is correct. A transfer price is the price charged by one subunit of a firm to another. When the subsidiary-buyer is in a foreign country, the higher the transfer, the higher the potential tariffs. However, the tax levied on a subsequent sale by the subsidiary will be lower because of its higher acquisition cost.

Cost-volume-profit (CVP) analysis is a key factor in many decisions, including choice of product lines, pricing of products, marketing strategy, and use of productive facilities. A calculation used in a CVP analysis is the breakeven point. Once the breakeven point has been reached, operating income will increase by the

A. Gross margin per unit for each additional unit sold.
B. Contribution margin per unit for each additional unit sold.
C. Fixed costs per unit for each additional unit sold.
D. Variable costs per unit for each additional unit sold.

Answer (A) is incorrect because the gross margin equals sales price minus cost of goods sold, including fixed cost.
Answer (B) is correct. At the breakeven point, total revenue equals total fixed costs plus the variable costs incurred at that level of production. Beyond the breakeven point, each unit sale will increase operating income by the unit contribution margin (unit sales price – unit variable cost) because fixed cost will already have been recovered.
Answer (C) is incorrect because all fixed costs have been covered at the breakeven point.
Answer (D) is incorrect because operating income will increase by the unit contribution margin, not the unit variable cost.

The change in period-to-period operating income when using variable costing can be explained by the change in the

A. Unit sales level multiplied by the unit sales price.
B. Finished goods inventory level multiplied by the unit sales price.
C. Unit sales level multiplied by a constant unit contribution margin.
D. Finished goods inventory level multiplied by a constant unit contribution margin.

Answer (A) is incorrect because unit sales multiplied by the sales price equals sales revenue, but this amount does not necessarily correlate with operating income. A change in unit variable costs may cause revenue and operating income to move in different directions.
Answer (B) is incorrect because operating income is not necessarily correlated positively or negatively with finished goods inventory, however valued.
Answer (C) is correct. In a variable costing system, only the variable costs are recorded as product costs. All fixed costs are expensed in the period incurred. Because changes in the relationship between production levels and sales levels do not cause changes in the amount of fixed manufacturing cost expensed, profits more directly follow the trends in sales, especially when the UCM (selling price per unit – variable costs per unit) is constant. Unit sales times the UCM equals the total CM, and operating income (a pretax amount) equals the CM minus fixed costs of operations. If the UCM is constant and fixed costs are stable, the change in operating income will approximate the change in the CM (unit sales × UCM).
Answer (D) is incorrect because operating income is not necessarily correlated positively or negatively with finished goods inventory, however valued.
If inventories are expected to change, the type of costing that provides the best information for breakeven analysis is

A. Job order costing.
B. Variable (direct) costing.
C. Joint costing.
D. Absorption (full) costing.

- Answer (A) is incorrect because Job order costing does not separate fixed costs from variable costs.
- Answer (B) is correct. A variable (direct) costing system is needed to perform CVP analysis because variable costing separates fixed costs from variable costs.
- Answer (C) is incorrect because Joint costing does not separate fixed costs from variable costs.
- Answer (D) is incorrect because Absorption (full) costing does not separate fixed costs from variable costs.

One of the major assumptions limiting the reliability of breakeven analysis is that

A. Efficiency and productivity will continually increase.
B. Total variable costs will remain unchanged over the relevant range.
C. Total fixed costs will remain unchanged over the relevant range.
D. The cost of production factors varies with changes in technology.

- Answer (A) is incorrect because Breakeven analysis assumes no changes in efficiency and productivity.
- Answer (B) is incorrect because Total variable costs, by definition, change across the relevant range.
- Answer (C) is correct. One of the inherent simplifying assumptions used in CVP analysis is that fixed costs remain constant over the relevant range of activity.
- Answer (D) is incorrect because The cost of production factors is assumed to be stable; this is what is meant by relevant range.

The margin of safety is a key concept of CVP analysis. The margin of safety is the

A. Contribution margin rate.
B. Difference between budgeted contribution margin and breakeven contribution margin.
C. Difference between budgeted sales and breakeven sales.
D. Difference between the breakeven point in sales and cash flow breakeven.

- Answer (A) is incorrect because The contribution margin rate is computed by dividing contribution margin by sales. The contribution margin equals sales minus total variable costs.
- Answer (B) is incorrect because The margin of safety is expressed in revenue or units, not contribution margin.
- Answer (C) is correct. The margin of safety measures the amount by which sales may decline before losses occur. It is the excess of budgeted or actual sales over sales at the BEP.
- Answer (D) is incorrect because Cash flow is not relevant.
When used in cost-volume-profit analysis, sensitivity analysis

A. Determines the most profitable mix of products to be sold.
B. Allows the decision maker to introduce probabilities in the evaluation of decision alternatives.
C. Is done through various possible scenarios and computes the impact on profit of various predictions of future events.
D. Is limited because, in cost-volume-profit analysis, costs are not separated into fixed and variable components.

- Answer (A) is incorrect because CVP analysis assumes either a constant product mix or only one product.
- Answer (B) is incorrect because Expected value analysis allows the decision maker to introduce probabilities in the evaluation of decision alternatives.
- Answer (C) is correct. Sensitivity analysis is the process of observing how a mathematical model’s outcome is affected when the input parameters are changed. CVP analysis is extremely useful for this kind of exercise.
- Answer (D) is incorrect because To perform cost-volume-profit analysis, costs must be separated into fixed and variable components.

Marston Enterprises sells three chemicals: petrol, septine, and tridol. Petrol is the company’s most profitable product; tridol is the least profitable. Which one of the following events will definitely decrease the firm’s overall breakeven point for the upcoming accounting period?

A. The installation of new computer-controlled machinery and subsequent layoff of assembly-line workers.
B. A decrease in tridol’s selling price.
C. An increase in the overall market for septine.
D. An increase in anticipated sales of petrol relative to sales of septine and tridol.

- Answer (A) is incorrect because The acquisition of new machinery will result in greater fixed costs and thus a higher breakeven point.
- Answer (B) is incorrect because A decrease in selling price reduces the unit contribution margin, which in turn increases the breakeven point.
- Answer (C) is incorrect because The effect of an increase in the market for septine cannot be determined. The facts given do not indicate whether its unit contribution margin is greater or less than the weighted-average unit contribution margin for all the products.
- Answer (D) is correct. Since petrol is the company’s most profitable product, it has a higher unit contribution margin than septine and tridol. Thus, an increase in sales of petrol relative to the other products will result in a higher weighted-average unit contribution margin and a lower breakeven point (fixed costs ÷ weighted-average UCM).

Which of the following will result in raising the breakeven point?

A. A decrease in the variable cost per unit.
B. An increase in the semivariable cost per unit.
C. An increase in the contribution margin per unit.
D. A decrease in income tax rates.

- Answer (A) is incorrect because If other factors are constant, an increase in sales price or a decrease in unit variable cost increases the unit contribution margin and lowers the BEP.
Answer (B) is correct. An increase in semivariable costs consists of either higher fixed cost, higher variable cost, or both. An increase in either will raise the BEP. If fixed costs increase, more units must be sold to cover the greater fixed costs. If variable costs increase, the unit contribution margin will decrease and again more units must be sold to cover the fixed costs.

Answer (C) is incorrect because An increase in the unit contribution margin lowers the BEP.

Answer (D) is incorrect because If income taxes are taken into account, they are treated as variable costs. A decrease in variable costs lowers the BEP.

A company’s breakeven point in sales dollars may be affected by equal percentage increases in both selling price and variable cost per unit (assume all other factors are constant within the relevant range). The equal percentage changes in selling price and variable cost per unit will cause the breakeven point in sales dollars to

A. Decrease by less than the percentage increase in selling price.
B. Decrease by more than the percentage increase in the selling price.
C. Increase by the percentage change in variable cost per unit.
D. Remain unchanged.

Answer (A) is incorrect because The breakeven point in sales dollars will not change.
Answer (B) is incorrect because The CMR will remain the same. Therefore, the breakeven point in sales dollars will remain unchanged.
Answer (C) is incorrect because The breakeven point in sales dollars will not change.
Answer (D) is correct. The BEP in sales dollars is equal to total fixed costs divided by the CMR, and the CMR equals unit contribution margin divided by unit price. Equal percentage changes in the CMR numerator and denominator leave the overall ratio unaffected. Algebraically, this can be shown as follows:

If CM ÷ Price = CMR, then (1.1 × CM) ÷ (1.1 × Price) = CMR.

With CMR unchanged, the ratio of fixed costs to CMR is unchanged.

The breakeven point in units increases when unit costs

A. Increase and sales price remains unchanged.
B. Decrease and sales price remains unchanged.
C. Remain unchanged and sales price increases.
D. Decrease and sales price increases.

Answer (A) is correct. The breakeven point in units is calculated by dividing total fixed costs by the unit contribution margin. If selling price is constant and costs increase, the unit contribution margin will decline, resulting in an increase of the breakeven point.
Answer (B) is incorrect because A decrease in costs will cause the unit contribution margin to increase, lowering the breakeven point.
Answer (C) is incorrect because An increase in the selling price will increase the unit contribution margin, resulting in a lower breakeven point.
Answer (D) is incorrect because Both a cost decrease and a sales price increase will increase the unit contribution margin, resulting in a lower breakeven point.
For a profitable company, the amount by which sales can decline before losses occur is known as the

- A. Sales volume variance.
- B. Hurdle rate.
- C. Variable sales ratio.
- D. Margin of safety.

- Answer (A) is incorrect because The sales quantity (volume) variance focuses on the firm’s aggregate results.
- Answer (B) is incorrect because The hurdle rate is used in capital budgeting.
- Answer (C) is incorrect because “Variable sales ratio” is not a meaningful term in this context.
- Answer (D) is correct. The margin of safety measures the amount by which sales may decline before losses occur. It equals budgeted or actual sales minus sales at the BEP. It may be stated in either units sold or sales revenue.

When an organization is operating above the breakeven point, the degree or amount that sales may decline before losses are incurred is called the

- A. Residual income rate.
- B. Marginal rate of return.
- C. Margin of safety.
- D. Target (hurdle) rate of return.

- Answer (A) is incorrect because Residual income is the excess of earnings over an imputed charge for the given investment base.
- Answer (B) is incorrect because A marginal rate of return is the return on the next investment.
- Answer (C) is correct. The margin of safety is the excess of budgeted revenues over breakeven revenues. It is considered in sensitivity analysis.
- Answer (D) is incorrect because A target or hurdle rate of return is the required rate of return. It is also known as the discount rate or the opportunity cost of capital.

Which one of the following is true regarding a relevant range?

- A. Total variable costs will not change.
- B. Total fixed costs will not change.
- C. Actual fixed costs usually fall outside the relevant range.
- D. The relevant range cannot be changed after being established.

- Answer (A) is incorrect because Variable costs will change in total, but unit variable costs will be constant across the relevant range.
- Answer (B) is correct. The relevant range is the range of activity over which unit variable costs and total fixed costs are constant.
- Answer (C) is incorrect because Actual fixed costs should not vary greatly from budgeted fixed costs for the relevant range.
- Answer (D) is incorrect because The relevant range can change whenever production activity changes; the relevant range is merely an assumption used for budgeting and control purposes.
Positive operating income is shown on a cost-volume-profit chart when the

A. Total variable expense line exceeds the total fixed expense line.
B. Total expense line exceeds the total sales revenue line.
C. Total sales revenue line exceeds the total fixed expense line.
D. Total sales revenue line exceeds the total expense line.

- Answer (A) is incorrect because Net income cannot be determined by comparing the total variable expense and total fixed expense lines.
- Answer (B) is incorrect because The company will incur a net loss when the total expense line exceeds the total sales revenue line.
- Answer (C) is incorrect because Merely exceeding total fixed expenses does not necessarily result in positive operating income.
- Answer (D) is correct. A cost-volume-profit chart contains elements (lines, points, axes) that identify variable cost, fixed cost, the breakeven point, total revenue, profit, and volume in units. When the total sales revenue line rises above the total expense line, a company will have positive net income.

Breakeven quantity is defined as the volume of output at which revenues are equal to

A. Marginal costs.
B. Total costs.
C. Variable costs.
D. Fixed costs.

- Answer (A) is incorrect because Marginal costs are the costs of increasing output by 1 unit.
- Answer (B) is correct. Breakeven quantity is defined as the volume of output at which revenues are equal to total costs.
- Answer (C) is incorrect because Breakeven analysis looks at total costs, not just variable costs.
- Answer (D) is incorrect because Breakeven analysis looks at total costs, not just fixed costs.

All of the following are assumptions of cost-volume-profit analysis except

A. Total fixed costs do not change with a change in volume.
B. Revenues change proportionately with volume.
C. Variable costs per unit change proportionately with volume.
D. Sales mix for multi-product situations do not vary with volume changes.

- Answer (A) is incorrect because One of the assumptions of cost-volume-profit analysis is that total fixed costs do not change with a change in volume.
- Answer (B) is incorrect because One of the assumptions of cost-volume-profit analysis is that revenues change proportionately with volume.
- Answer (C) is correct. CVP analysis assumes the variable costs per unit are constant over the relevant range.
- Answer (D) is incorrect because One of the assumptions of cost-volume-profit analysis is that the sales mix for multi-product situations do not vary with volume changes.
Specialty, Inc., has a limited supply of 1,200 lbs of raw materials that can be used to produce either Product X or Y, details of which are given below.

<table>
<thead>
<tr>
<th></th>
<th>Product X</th>
<th>Product Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$200</td>
<td>$250</td>
</tr>
<tr>
<td>Variable costs per unit</td>
<td>$176</td>
<td>$200</td>
</tr>
<tr>
<td>Raw materials used per unit</td>
<td>8 lbs</td>
<td>10 lbs</td>
</tr>
</tbody>
</table>

Which one of the following should Specialty produce in order to maximize contribution margin?

A. 150 units of Product X.
B. 120 units of Product Y.
C. 100 units of Product X and 40 units of Product Y.
D. 100 units of Product X and 80 units of Product Y.

- Answer (A) is incorrect because Because Product Y’s UCM is greater than Product X’s and there is a limited supply, only Product Y should be sold in order to maximize the contribution margin.
- Answer (B) is correct. The unit contribution margin (UCM) is defined as the unit selling price less the unit variable cost. Product X’s UCM is $24 ($200 – $176). Product Y’s UCM is $50 ($250 – $200). Because Product Y’s UCM is greater than Product X’s and there is a limited supply, only Product Y should be sold in order to maximize the contribution margin.
- Answer (C) is incorrect because Because Product Y’s UCM is greater than Product X’s and there is a limited supply, only Product Y should be sold in order to maximize the contribution margin.
- Answer (D) is incorrect because Because Product Y’s UCM is greater than Product X’s and there is a limited supply, only Product Y should be sold in order to maximize the contribution margin.

Blount, Inc., is considering discontinuing a certain product line if it does not have a margin of safety higher than 15%. The breakeven sales are $76,800, and the margin of safety is $13,200. Based on this information, the controller has recommended that Blount keep this product line. Did the controller make the appropriate decision?

A. No, because the margin of safety ratio of 17.2% is not better than 15%.
B. Yes, because the margin of safety ratio of 17.2% is better than 15%.
C. No, because the margin of safety ratio of 14.7% is not better than 15%.
D. Yes, because the margin of safety ratio of 14.7% is better than 15%.

- Answer (A) is incorrect because This answer choice incorrectly calculates the margin of safety ratio as margin of safety (in dollars) to breakeven sales. The correct ratio is the margin of safety (in dollars) to budgeted sales.
- Answer (B) is incorrect because This answer choice incorrectly calculates the margin of safety ratio as margin of safety (in dollars) to breakeven sales. The correct ratio is the margin of safety (in dollars) to budgeted sales.
- Answer (C) is correct. The margin of safety ratio is the ratio of margin of safety (in dollars) to budgeted sales. In this question, budgeted sales are not given but can be calculated using the margin of safety (in dollars) formula and the values given in the question:

\[
\text{Margin of safety (in dollars) = Budgeted sales – Breakeven sales}
\]

\[
\$13,200 = \text{Budgeted sales} - \$76,800
\]

\[
\text{Budgeted sales} = \$90,000
\]

Given the budgeted sales, the margin of safety ratio is 14.47% ($13,200 ÷ $90,000). Because this value does not exceed the 15% requirement, the controller did not make the appropriate decision.
Answer (D) is incorrect because 14.7% is not a better margin of safety ratio than 15%.

Which of the following would decrease unit contribution margin the most?

A. A 15% decrease in selling price.
B. A 15% increase in variable expenses.
C. A 15% decrease in variable expenses.
D. A 15% decrease in fixed expenses.

Answer (A) is correct. Unit contribution margin (UCM) equals unit selling price minus unit variable costs. It can be decreased by either lowering the price or raising the variable costs. As long as UCM is positive, a given percentage change in selling price must have a greater effect than an equal but opposite percentage change in variable cost. The example below demonstrates this point.

Original: \[ UCM = SP - UVC \]
\[ = \$100 - \$50 \]
\[ = \$50 \]

Lower Selling Price: \[ UCM = (SP \times .85) - UVC \]
\[ = \$85 - \$50 \]
\[ = \$35 \]

Higher Variable Cost: \[ UCM = SP - (UVC \times 1.15) \]
\[ = \$100 - \$57.50 \]
\[ = \$42.50 \]

Since $35 < $42.50, the lower selling price has the greater effect.

Answer (B) is incorrect because a 15% increase in variable expenses will not decrease the CM as much as a 15% decrease in sales price.

Answer (C) is incorrect because a decrease in variable expenses would increase UCM.

Answer (D) is incorrect because fixed expenses have no effect on the contribution margin.

Two companies produce and sell the same product in a competitive industry. Thus, the selling price of the product for each company is the same. Company 1 has a contribution margin ratio of 40% and fixed costs of $25 million. Company 2 is more automated, making its fixed costs 40% higher than those of Company 1. Company 2 also has a contribution margin ratio that is 30% greater than that of Company 1. By comparison, Company 1 will have the List A breakeven point in terms of dollar sales volume and will have the List B dollar profit potential once the indifference point in dollar sales volume is exceeded.

<table>
<thead>
<tr>
<th>List A</th>
<th>List B</th>
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<tbody>
<tr>
<td>A. Lower</td>
<td>Lesser</td>
</tr>
<tr>
<td>B. Lower</td>
<td>Greater</td>
</tr>
<tr>
<td>C. Higher</td>
<td>Lesser</td>
</tr>
<tr>
<td>D. Higher</td>
<td>Greater</td>
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</tbody>
</table>

Answer (A) is correct. Company 1's breakeven point is lower because its fixed costs are lower. Company 1’s breakeven point is $62,500,000 ($25,000,000 ÷ 40%). Company 2’s breakeven point is $67,307,692 \[ ((25,000,000 \times 1.4) ÷ (40\% \times 1.3)) \]. The indifference point, at which dollar profits are equal, is $83,333,333 ($25,000,000 + .60X = $35,000,000 + .48X). Once the indifference point is passed, Company 1 will make lower profits than Company 2 because Company 2 has a higher contribution margin.
Answer (B) is incorrect because Company 1’s breakeven point is lower, but its profits will be lower past the indifference point.
Answer (C) is incorrect because Company 1’s breakeven point is lower, but its profits will be lower past the indifference point.
Answer (D) is incorrect because Company 1’s breakeven point is lower, but its profits will be lower past the indifference point.

The breakeven point in units sold for Tierson Corporation is 44,000. If fixed costs for Tierson are equal to $880,000 annually and variable costs are $10 per unit, what is the contribution margin per unit for Tierson Corporation?

A. $0.05  
B. $20.00  
C. $44.00  
D. $88.00

Answer (A) is incorrect because This amount results from inverting the numerator and denominator in the calculation.
Answer (B) is correct. The breakeven point in units is equal to the fixed costs divided by the contribution margin per unit. Thus, the UCM is $20.00 ($880,000 ÷ 44,000 units).
Answer (C) is incorrect because This amount results from using variable cost as part of the calculation.
Answer (D) is incorrect because This amount results from dividing by an erroneous denominator.

A manufacturer contemplates a change in technology that would reduce fixed costs from $800,000 to $700,000. However, the ratio of variable costs to sales will increase from 68% to 80%. What will happen to break even level of revenues?

A. Decrease by $301,470.50.  
B. Decrease by $500,000.  
C. Decrease by $1,812,500.  
D. Increase by $1,000,000.

Answer (A) is incorrect because This amount uses the variable cost percentage in the denominator instead of the contribution margin percentage.
Answer (B) is incorrect because This amount uses the same contribution margin percentage (20%) in both calculations.
Answer (C) is incorrect because This amount reverses the two contribution margin percentages.
Answer (D) is correct. The original breakeven level was:

Breakeven point = Fixed costs ÷ Contribution margin ratio
= $800,000 ÷ (1.0 – .68)
= $2,500,000

The new level is:

Breakeven point = Fixed costs ÷ Contribution margin ratio
= $700,000 ÷ (1.0 – .80)
= $3,500,000

Thus, there is an increase of $1,000,000 ($3,500,000 – $2,500,000).

[1015] How much does each additional sales dollar contribute toward profit for a firm with $4 million breakeven level of revenues and $1.2 million in fixed costs including depreciation?

A. $0.30  
B. $0.33  
C. $0.50  
D. $0.67

Answer (A) is correct. The breakeven point in dollars equals total fixed costs divided by the contribution margin ratio. This firm’s CMR is 30% ($4,000,000 = $1,200,000 ÷ .30), so each additional sales dollar contributes $0.30 toward profit.

Answer (B) is incorrect because When substituted into the original breakeven formula, it would not have produced a breakeven level of $4 million.

Answer (C) is incorrect because When substituted into the original breakeven formula, it would not have produced a breakeven level of $4 million.

Answer (D) is incorrect because When substituted into the original breakeven formula, it would not have produced a breakeven level of $4 million.

[1016] What is the breakeven point in units for a product that sells for $10 if fixed costs are $4,000 and variable costs are 20%?

A. 250  
B. 500  
C. 800  
D. 2,000

Answer (A) is incorrect because Using an erroneous contribution margin results in 250.

Answer (B) is correct. The breakeven point is where profit is zero and sales = fixed costs + variable costs, so 10x = 4,000 + 2x. Thus, 8x = 4,000, or x = 500 units. Alternatively, dividing the $4,000 of fixed costs by the $8 per unit contribution margin gives the same result.

Answer (C) is incorrect because Using the inverse of the contribution margin results in 800.

Answer (D) is incorrect because Applying the 20% to fixed costs instead of sales results in 2,000.
[Fact Pattern #81]
Madengrad Company manufactures a single electronic product called Precisionmix. This unit is a batch-density monitoring device attached to large industrial mixing machines used in flour, rubber, petroleum, and chemical manufacturing. Precisionmix sells for $900 per unit. The following variable costs are incurred to produce each Precisionmix device:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>$180</td>
</tr>
<tr>
<td>Direct materials</td>
<td>240</td>
</tr>
<tr>
<td>Factory overhead</td>
<td>105</td>
</tr>
<tr>
<td>Variable production costs</td>
<td>525</td>
</tr>
<tr>
<td>Marketing costs</td>
<td>75</td>
</tr>
<tr>
<td><strong>Total variable costs</strong></td>
<td><strong>$600</strong></td>
</tr>
</tbody>
</table>

Madengrad’s income tax rate is 40%, and annual fixed costs are $6,600,000. Except for an operating loss incurred in the year of incorporation, the firm has been profitable over the last 5 years.

[1017](Refers to Fact Pattern #81)
If Madengrad Company achieves a sales and production volume of 8,000 units, the annual before-tax income (loss) will be

A. $(4,200,000)
B. $1,780,000
C. $(2,520,000)
D. $(420,000)

Answer (A) is **correct**. At a volume of 8,000 units, sales will be $7,200,000 (8,000 units × $900), and variable costs will be $4,800,000 (8,000 units × $600). Thus, the contribution margin is $2,400,000. Deducting the $6,600,000 of fixed costs from the contribution margin leaves a net loss of $4,200,000.

Answer (B) is incorrect because The annual before-tax (loss) is $(4,200,000) ($7,200,000 sales – $4,800,000 variable costs – $6,600,000 fixed costs).

Answer (C) is incorrect because The annual before-tax (loss) is $(4,200,000) ($7,200,000 sales – $4,800,000 variable costs – $6,600,000 fixed costs).

Answer (D) is incorrect because The annual before-tax (loss) is $(4,200,000) ($7,200,000 sales – $4,800,000 variable costs – $6,600,000 fixed costs).

[1018](Refers to Fact Pattern #81)
The annual sales volume required for Madengrad Company to break even is

A. 22,000 units.
B. 11,000 units.
C. 8,400 units.
D. 13,888 units.

Answer (A) is **correct**. The formula for the breakeven point in units divides the fixed costs by the unit contribution margin ($900 selling price – $600 unit variable cost = $300). Hence, the breakeven point is 22,000 units ($6,600,000 ÷ 300).

Answer (B) is incorrect because The breakeven point is determined by dividing the fixed costs ($6,600,000) by the unit contribution margin ($900 selling price – $600 unit variable cost = $300).
Answer (C) is incorrect because the breakeven point is determined by dividing the fixed costs ($6,600,000) by the unit contribution margin ($900 selling price – $600 unit variable cost = $300).

Answer (D) is incorrect because the breakeven point is determined by dividing the fixed costs ($6,600,000) by the unit contribution margin ($900 selling price – $600 unit variable cost = $300).

Answer (A) is incorrect because the unit variable cost is reduced by $24, so UCM is $324. The contribution margin percentage will be 36% ($324 ÷ $900).

Answer (B) is incorrect because the unit variable cost is reduced by $24, so UCM is $324. The contribution margin percentage will be 36% ($324 ÷ $900).

Answer (C) is incorrect because the unit variable cost is reduced by $24, so UCM is $324. The contribution margin percentage will be 36% ($324 ÷ $900).

Answer (D) is incorrect because the unit variable cost is reduced by $24, so UCM is $324. The contribution margin percentage will be 36% ($324 ÷ $900).

Answer (C) is correct. The original unit contribution margin (UCM) was $300 ($900 selling price – $600 unit variable cost). Unit direct labor cost is now 20% higher ($180 × 20% = $36), and unit direct materials cost is reduced by 25% ($240 × 25% = $60). Thus, the net result is that unit variable cost is reduced by $24 ($60 – $36), and the UCM will be $324 ($300 + $24). The new contribution margin percentage is therefore 36% ($324 ÷ $900).

Answer (D) is incorrect because the unit variable cost is reduced by $24, so UCM is $324. The contribution margin percentage will be 36% ($324 ÷ $900).

Answer (A) is incorrect because the new breakeven point is 22,407 units ($6,600,000 × 1.1) fixed costs ÷ $324. The new breakeven point is an increase of 407 units (22,407 units – 22,000 units at the previous breakeven point).

Answer (B) is incorrect because the new breakeven point is 22,407 units ($6,600,000 × 1.1) fixed costs ÷ $324. The new breakeven point is an increase of 407 units (22,407 units – 22,000 units at the previous breakeven point).

Answer (C) is incorrect because the new breakeven point is 22,407 units ($6,600,000 × 1.1) fixed costs ÷ $324. The new breakeven point is an increase of 407 units (22,407 units – 22,000 units at the previous breakeven point).

Answer (D) is correct. The new contribution margin is $324. Dividing this amount into the fixed costs will determine the new unit breakeven point. Fixed costs have increased by 10% to $7,260,000 ($6,600,000 × 1.1), and the new breakeven point is 22,407 units ($7,260,000 ÷ $324). The original unit breakeven point was 22,000 units. Hence, the production changes increased the breakeven point by 407 units (22,407 – 22,000).
A company has sales of $500,000, variable costs of $300,000, and operating income of $150,000. If the company increased the sales price per unit by 10%, reduced fixed costs by 20%, and left variable cost per unit unchanged, what would be the new breakeven point in sales dollars?

A. $88,000  
B. $100,000  
C. $110,000  
D. $125,000

**Answer (A) is correct.** The breakeven point in sales dollars is equal to total fixed costs divided by the contribution margin ratio. Fixed costs are $50,000 ($500,000 sales – $300,000 variable costs – $150,000 operating income). If sales increase by 10% ($500,000 × 1.10 = $550,000) and fixed costs decrease by 20% ($50,000 × .80 = $40,000), the new contribution margin is 45.45% ([($550,000 – $300,000) ÷ $550,000]). The new breakeven point can be calculated as follows:

\[
\text{BEP in dollars} = \frac{\text{Fixed costs}}{\text{CMR}} = \frac{40,000}{.4545} = 88,000
\]

**Answer (B) is incorrect because Ignoring the 10% sales price increase results in $100,000.**  
**Answer (C) is incorrect because Ignoring the 20% decrease in fixed costs results in $110,000.**  
**Answer (D) is incorrect because Ignoring the changes in sales price and fixed costs results in $125,000.**

**[Fact Pattern #82]**

Total production costs of prior periods for a company are listed as follows. Assume that the same cost behavior patterns can be extended linearly over the range of 3,000 to 35,000 units and that the cost driver for each cost is the number of units produced.

<table>
<thead>
<tr>
<th>Production in Units per Month</th>
<th>3,000</th>
<th>9,000</th>
<th>16,000</th>
<th>35,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost X</td>
<td>$23,700</td>
<td>$52,680</td>
<td>$86,490</td>
<td>$178,260</td>
</tr>
<tr>
<td>Cost Y</td>
<td>47,280</td>
<td>141,840</td>
<td>252,160</td>
<td>551,600</td>
</tr>
</tbody>
</table>

**What is the average cost per unit at a production level of 8,000 units for cost X?**

A. $5.98  
B. $5.85  
C. $7.90  
D. $4.83

**Answer (A) is correct.** Cost X is a mixed cost (part variable and part fixed). The high-low method can be used to determine the fixed and variable portions. Dividing the total cost of X at two different production volumes by the difference in units produced gives a unit variable cost of $4.83 ([($178,260 – $23,700) ÷ (35,000 units – 3,000 units)]). Fixed cost must therefore be $9,210 [($178,260 cost of X for 35,000 units – (35,000 units × $4.83)]). Total cost of X for 8,000 units is $47,850 [$9,210 + (8,000 units × $4.83)], and the average cost is $5.98 ($47,850 ÷ 8,000).

**Answer (B) is incorrect because The average cost of 9,000 units equals $5.85.**  
**Answer (C) is incorrect because The average cost of 3,000 units equals $7.90.**
Answer (D) is incorrect because The amount of $4.83 is the variable cost per unit.

Romashka, Inc., plans to introduce a new product. The marketing manager forecasts a unit selling price of $500. The variable cost per unit is estimated to be $100. In addition, there is a total of $110,000 fixed indirect manufacturing costs, and $150,000 in fixed operating costs associated with these units. What quantity will the company have to sell to break even?

A. 220 units.
B. 275 units.
C. 520 units.
D. 650 units.

Answer (A) is incorrect because Failing to take the $150,000 of fixed operating costs and the $100 of variable per unit cost into account results in 220 units.

Answer (B) is incorrect because Failing to take the $150,000 of fixed operating costs into account results in 275 units.

Answer (C) is incorrect because Failing to take the $100 of variable per unit cost into account results in 520 units.

Answer (D) is correct. The breakeven point in units equals total fixed costs divided by the unit contribution margin. Romashka’s breakeven quantity can therefore be derived thusly:

Breakeven point = \( \frac{($110,000 + $150,000)}{($500 – $100)} \)
\= \( \frac{260,000}{400} \)
\= 650 units

[Fact Pattern #83]

Delphi Company has developed a new project that will be marketed for the first time during the next fiscal year. Although the Marketing Department estimates that 35,000 units could be sold at $36 per unit, Delphi’s management has allocated only enough manufacturing capacity to produce a maximum of 25,000 units of the new product annually. The fixed costs associated with the new product are budgeted at $450,000 for the year, which includes $60,000 for depreciation on new manufacturing equipment.

Data associated with each unit of product are presented as follows. Delphi is subject to a 40% income tax rate.

| Direct material | $ 7.00 |
| Direct labor | $ 3.50 |
| Manufacturing overhead | $ 4.00 |
| Variable manufacturing cost | $14.50 |
| Selling expenses | $ 1.50 |
| Total variable cost | $16.00 |

The number of units of the new product that Delphi Company must sell during the next fiscal year in order to break even is

A. 20,930
B. 18,140
C. 22,500
D. 25,500
● Answer (A) is incorrect because this figure excludes the $1.50 of variable selling expenses from the unit contribution margin.

● Answer (B) is incorrect because this figure excludes the $1.50 of variable selling expenses from the unit contribution margin and the depreciation from the fixed costs.

● Answer (C) is correct. The breakeven point in units equals total fixed costs divided by the unit contribution margin. The unit contribution margin is $20 ($36 selling price – $16 unit variable cost). Hence, the breakeven point is 22,500 units ($450,000 ÷ $20).

● Answer (D) is incorrect because this figure adds the $60,000 of depreciation to the fixed costs.

---

**Fact Pattern #84**

Bruell Electronics Co. is developing a new product, surge protectors for high-voltage electrical flows. The cost information below relates to the product:

<table>
<thead>
<tr>
<th>Unit Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$3.25</td>
</tr>
<tr>
<td>Direct labor</td>
<td>4.00</td>
</tr>
<tr>
<td>Distribution</td>
<td>.75</td>
</tr>
</tbody>
</table>

The company will also be absorbing $120,000 of additional fixed costs associated with this new product. A corporate fixed charge of $20,000 currently absorbed by other products will be allocated to this new product.

---

**[1025]** Refers to Fact Pattern #84

If the selling price is $14 per unit, the breakeven point in units (rounded to the nearest hundred) for surge protectors is

A. 8,500 units.
B. 10,000 units.
C. 15,000 units.
D. 20,000 units.

● Answer (A) is incorrect because a breakeven point of 8,500 units ignores variable costs.

● Answer (B) is incorrect because the breakeven point is 20,000 units when the contribution margin is $6 per unit.

● Answer (C) is incorrect because this number of units equals fixed costs divided by unit variable cost.

● Answer (D) is correct. The breakeven point in units for a new product equals total additional fixed costs divided by the unit contribution margin. Unit variable costs total $8 ($3.25 + $4.00 + $.75). Thus, UCM is $6 ($14 unit selling price – $6 unit variable cost), and the breakeven point is 20,000 units ($120,000 ÷ $6).
**Fact Pattern #85**

Barnes Corporation manufactures skateboards and is in the process of preparing next year’s budget. The pro forma income statement for the current year is presented below.

<table>
<thead>
<tr>
<th>Sales</th>
<th>$1,500,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of sales:</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td>$250,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>150,000</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>75,000</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>100,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$925,000</td>
</tr>
<tr>
<td>Selling and G&amp;A:</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>$200,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>250,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$475,000</td>
</tr>
</tbody>
</table>

The breakeven point (rounded to the nearest dollar) for Barnes Corporation for the current year is

- A. $146,341
- B. $636,364
- C. $729,730
- D. $181,818

- Answer (A) is incorrect because this amount does not even cover fixed costs.
- Answer (B) is correct. Fixed costs total $350,000 ($100,000 overhead + $250,000 SG&A). Variable costs total $675,000. Given sales of $1,500,000, the contribution margin is $825,000 ($1,500,000 – $675,000). Thus, the contribution margin percentage is 55% ($825,000 ÷ $1,500,000). Dividing the $350,000 of fixed costs by 55% produces a breakeven point of $636,363.64.
- Answer (C) is incorrect because this amount of sales results in a small profit.
- Answer (D) is incorrect because this amount does not cover the $350,000 of fixed costs.

**Fact Pattern #85**

For the coming year, the management of Barnes Corporation anticipates a 10% increase in sales, a 12% increase in variable costs, and a $45,000 increase in fixed expenses. The breakeven point for next year will be

- A. $729,027
- B. $862,103
- C. $214,018
- D. $474,000

- Answer (A) is correct. Sales are expected to be $1,650,000 ($1,500,000 × 1.10), variable costs $756,000 ($675,000 × 1.12), and fixed expenses $395,000 ($350,000 + $45,000). Thus, the contribution margin will be $894,000 ($1,650,000 – $756,000), and the contribution margin percentage is 54.1818%. The breakeven point is therefore $729,027 ($395,000 fixed expenses ÷ .541818).
- Answer (B) is incorrect because the contribution margin percentage is computed by dividing the contribution margin (total sales – total variable costs) by total sales, not by dividing the total variable costs by total sales.
Answer (C) is incorrect because This amount does not cover fixed costs.
Answer (D) is incorrect because This amount barely covers fixed costs.

A company manufactures a single product. Estimated cost data regarding this product and other information for the product and the company are as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price per unit</td>
<td>$40</td>
</tr>
<tr>
<td>Total variable production cost per unit</td>
<td>$22</td>
</tr>
<tr>
<td>Sales commission (on sales)</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Fixed costs and expenses:</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$5,598,720</td>
</tr>
<tr>
<td>General and administrative</td>
<td>$3,732,480</td>
</tr>
<tr>
<td>Effective income tax rate</td>
<td>40%</td>
</tr>
</tbody>
</table>

The number of units the company must sell in the coming year in order to reach its breakeven point is

A. 388,800 units.
B. 518,400 units.
C. 583,200 units.
D. 972,000 units.

- Answer (A) is incorrect because Not subtracting the variable costs per unit from sales price results in 388,800 units.
- Answer (B) is incorrect because This number of units does not reflect the sales commissions in the total variable costs.
- Answer (C) is correct. The breakeven point is determined by dividing total fixed costs by the unit contribution margin. The total fixed costs are $9,331,200 ($5,598,720 manufacturing overhead + $3,732,480 general and administrative). The contribution margin is $16.00 ($40 sales price – $22 variable production cost – $2.00 commission). Thus, the breakeven point is 583,200 units ($9,331,200 ÷ $16).
- Answer (D) is incorrect because Including taxes in the total variable costs results in 972,000 units, which understates the unit contribution margin.

A company makes a product that sells for $30. During the coming year, fixed costs are expected to be $180,000, and variable costs are estimated at $26 per unit. How many units must the company sell to break even?

A. 6,000 units.
B. 6,924 units.
C. 45,000 units.
D. 720,000 units.

- Answer (A) is incorrect because This number of units will cover the fixed costs for the year but not the variable costs ($180,000 ÷ $30 = 6,000).
- Answer (B) is incorrect because Dividing the total fixed costs by the variable cost per unit rather than the contribution margin per unit results in 6,924 units.
- Answer (C) is correct. The contribution margin per unit is $4 ($30 selling price – $26 unit variable cost). Fixed costs of $180,000 divided by the contribution of $4 per unit gives breakeven sales volume of 45,000 units.
- Answer (D) is incorrect because The total fixed costs should be divided (not multiplied) by the unit contribution margin.
[Fact Pattern #86]
Oradell Company sells its single product at a price of $60 per unit and incurs the following variable costs per unit of product:

<table>
<thead>
<tr>
<th>Direct material</th>
<th>$16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>12</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>7</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$35</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total variable costs</strong></td>
<td><strong>$40</strong></td>
</tr>
</tbody>
</table>

Oradell’s annual fixed costs are $880,000, and Oradell is subject to a 30% income tax rate.

[1030](Refers to Fact Pattern #86)

The number of units of product that Oradell Company must sell annually to break even is

A. 22,000 units.
B. 44,000 units.
C. 35,200 units.
D. 30,800 units.

- Answer (A) is incorrect because Fixed cost ($880,000) divided by variable costs ($40) results in 22,000 units.
- Answer (B) is correct. The breakeven point in units equals total fixed costs divided by the contribution margin per unit. At a selling price of $60 per unit and with variable costs of $40 per unit, the unit contribution margin is $20. Thus, the breakeven point is 44,000 units ($880,000 ÷ $20).
- Answer (C) is incorrect because The contribution margin should reflect selling expenses.
- Answer (D) is incorrect because There are no income taxes at the breakeven point.

[1031](Refers to Fact Pattern #86)

If prime costs increased by 20% and all other values remained the same, Oradell Company’s contribution margin (to the nearest whole percent) is

A. .30
B. .76
C. .20
D. .24

- Answer (A) is incorrect because This is the contribution margin percentage that results from including manufacturing overhead as a prime cost.
- Answer (B) is incorrect because The contribution margin percentage that results from dividing total variable costs by the sales price is 76% ($45.60 ÷ 60).
- Answer (C) is incorrect because This is the contribution margin percentage that results from treating all variable costs as prime costs.
- Answer (D) is correct. Prime costs are direct materials and direct labor. These two elements totaled $28 ($16 + $12) before the increase, so the new total is $33.60 ($28 × 1.2). In other words, prime costs increase by $5.60, and total variable costs increase to $45.60. Subtracting $45.60 from the $60 selling price leaves a contribution margin of $14.40. The contribution margin percentage thus becomes 24% ($14.40 ÷ $60).
Sales (100,000 units) $1,000,000

Costs:

<table>
<thead>
<tr>
<th></th>
<th>Fixed</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$0</td>
<td>$300,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$0</td>
<td>200,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>100,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Selling and administrative costs</td>
<td>110,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Total costs</td>
<td>$210,000</td>
<td>$700,000</td>
</tr>
<tr>
<td>Budgeted operating income</td>
<td>$90,000</td>
<td></td>
</tr>
</tbody>
</table>

[1032] Refers to Fact Pattern #87

The Bidwell Company’s breakeven sales in units are

A. 30,000 units.
B. 91,000 units.
C. 60,000 units.
D. 70,000 units.

- Answer (A) is incorrect because Fixed costs should be divided by the contribution margin, not unit variable costs.
- Answer (B) is incorrect because Total cost ÷ selling price is 91,000 units.
- Answer (C) is incorrect because Selling and administrative costs are included in the contribution margin.
- Answer (D) is correct. The breakeven point in units is found by dividing total fixed costs by the contribution margin per unit. Variable costs are $700,000 at 100,000 units, or $7 per unit. Selling price is $10 per unit, resulting in a contribution margin per unit of $3. Dividing $210,000 of fixed costs by $3 per unit results in a breakeven point of 70,000 units.

[1033] Refers to Fact Pattern #87

If fixed costs increased $31,500 with no other cost or revenue factors changing, the breakeven sales in units is

A. 34,500 units.
B. 80,500 units.
C. 69,000 units.
D. 94,150 units.

- Answer (A) is incorrect because Fixed costs should be divided by the contribution margin, not the unit variable cost.
- Answer (B) is correct. The breakeven point equals fixed costs divided by the contribution margin per unit. The new total for fixed costs is $241,500 ($210,000 + $31,500), and the contribution margin per unit is still $3. The breakeven point is thus 80,500 units ($241,500 ÷ $3).
- Answer (C) is incorrect because Selling and administrative costs are reflected in the contribution margin.
- Answer (D) is incorrect because Total costs of $941,500 divided by selling price of $10 results in 94,150 units.
[Fact Pattern #88]
Donnelly Corporation manufactures and sells T-shirts imprinted with college names and slogans. Last year, the shirts sold for $7.50 each, and the variable cost to manufacture them was $2.25 per unit. The company needed to sell 20,000 shirts to break even. The net income last year was $5,040. Donnelly’s expectations for the coming year include the following:

- The sales price of the T-shirts will be $9
- Variable cost to manufacture will increase by one-third
- Fixed costs will increase by 10%
- The income tax rate of 40% will be unchanged

[1034](Refers to Fact Pattern #88)
The selling price that would maintain the same contribution margin rate as last year is

A. $9.00  
B. $8.25  
C. $10.00  
D. $9.75

- Answer (A) is incorrect because The expected price is $9.00, not the price with the same CMR.  
- Answer (B) is incorrect because The sum of the old UCM and the new unit variable cost is $8.25.  
- Answer (C) is correct. Last year, unit variable cost was $2.25, so the unit contribution margin (UCM) was $5.25 ($7.50 price – $2.25), and the contribution margin rate (CMR) was 70% ($5.25 ÷ $7.50). If variable costs increase by one-third, the new variable cost will be $3 [$2.25 × (4 ÷ 3)]. If a 70% CMR is desired, the $3 variable cost will be 30% of sales, and the unit sales price will be $10 ($3 ÷ 30%).  
- Answer (D) is incorrect because This amount is the sum of last year’s sales price of $7.50 and last year’s variable cost of $2.25.

[1035](Refers to Fact Pattern #88)
The number of T-shirts Donnelly Corporation must sell to break even in the coming year is

A. 17,500  
B. 19,250  
C. 20,000  
D. 22,000

- Answer (A) is incorrect because This amount is based on the preceding year’s fixed costs.  
- Answer (B) is correct. The breakeven point in units equals total fixed costs divided by the unit contribution margin. Fixed cost for the previous year was $105,000 (20,000 units at breakeven × $5.25 UCM). Fixed cost for the current year is $115,500 ($105,000 × 1.1). The new UCM is $6 ($9 selling price – $3 unit variable cost). Accordingly, the BEP is 19,250 units ($115,500 ÷ $6).  
- Answer (C) is incorrect because The preceding year’s BEP is 20,000.  
- Answer (D) is incorrect because This amount is the breakeven point if the current year’s fixed costs of $115,500 ($105,000 × 1.1) is divided by last year’s contribution margin of $5.25.
Kim is thinking of organizing a fundraiser to support a local charity. She has planned to rent a banquet hall and provide the guests with food, entertainment, and various party favors. She has decided to charge $500 a person. After researching around town, Kim has discovered the following costs:

<table>
<thead>
<tr>
<th>Costs</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Costs</td>
<td></td>
</tr>
<tr>
<td>Rental fee of banquet hall</td>
<td>$150,000</td>
</tr>
<tr>
<td>Advertising</td>
<td>$50,000</td>
</tr>
<tr>
<td>Entertainment</td>
<td>$4,000</td>
</tr>
<tr>
<td>Variable Costs</td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>$12</td>
</tr>
<tr>
<td>Other miscellaneous costs</td>
<td>8</td>
</tr>
</tbody>
</table>

What is Kim’s contribution margin?

A. $400  
B. $450  
C. $480  
D. $500

- Answer (A) is incorrect because Variable cost per person is $20.
- Answer (B) is incorrect because Variable cost per person is $20.
- Answer (C) is correct. Contribution margin equals revenue minus the per-unit variable cost, in this case, $480 ($500 – $20).
- Answer (D) is incorrect because Variable cost per person is $20.

How many guests must attend in order for Kim to break even?

A. 408  
B. 417  
C. 425  
D. 443

- Answer (A) is incorrect because Not subtracting variable costs from revenues to get the contribution margin results in 408.
- Answer (B) is incorrect because Not including the $4,000 of entertainment expenses in the fixed cost results in 417.
- Answer (C) is correct. The breakeven point in units equals total fixed costs ($150,000 + $50,000 + $4,000 = $204,000) divided by the unit contribution margin ($500 selling price – $12 food – $8 other = $480). Kim’s breakeven number of guests is thus 425 ($204,000 ÷ $480).
- Answer (D) is incorrect because Subtracting variable cost from the contribution margin results in 443.
Harper and her band want to put on a concert. They have looked at two venues, a small one and a large one, and have compiled the following information:

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity of venue</td>
<td>400</td>
<td>1,200</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$2,000</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

The variable cost per customer for both venues is $2. The band will charge $10 per customer for the small venue or $14 for the large venue.

**[1038](Refers to Fact Pattern #90)**

What is the breakeven point of the small venue?

A. 200  
B. 250  
C. 305  
D. 315

- Answer (A) is incorrect because Not subtracting the variable cost per person from the revenues per person results in 200 ticket sales.
- Answer (B) is correct. The breakeven point in units equals total fixed costs divided by the unit contribution margin. For the small venue, UCM is $8 ($10 selling price – $2 unit variable cost) and the breakeven point is 250 tickets ($2,000 ÷ $8).
- Answer (C) is incorrect because The amount needed to break even is 250 ticket sales.
- Answer (D) is incorrect because The amount needed to break even is 250 ticket sales.

**[1039](Refers to Fact Pattern #90)**

What is the breakeven point of the large venue?

A. 358  
B. 375  
C. 381  
D. 417

- Answer (A) is incorrect because Not subtracting the variable cost per person from the revenues per person results in 358 ticket sales.
- Answer (B) is incorrect because The amount needed to break even is 417 ticket sales.
- Answer (C) is incorrect because The amount needed to break even is 417 ticket sales.
- Answer (D) is correct. The breakeven point in units equals total fixed costs divided by the unit contribution margin. For the large venue, UCM is $12 ($14 selling price – $2 variable cost) and the breakeven point is 416.6 tickets ($5,000 ÷ $12).
[Fact Pattern #91]
The statement of income for Dimmell Co. presented below represents the operating results for the fiscal year just ended. Dimmell had sales of 1,800 tons of product during the current year. The manufacturing capacity of Dimmell’s facilities is 3,000 tons of product.

Dimmell Co.
Statement of Income
For the Year Ended December 31, Year 2

Sales $ 900,000

Variable costs:
  Manufacturing $315,000
  Selling costs 180,000 (495,000)

Contribution margin $ 405,000

Fixed costs:
  Manufacturing $  90,000
  Selling 112,500
  Administration 45,000 (247,500)

Operating income $ 157,500

Income taxes (40%) (63,000)

Net income $   94,500

Answer (A) is incorrect because Using only fixed manufacturing costs rather than all fixed costs results in 400 tons.
Answer (B) is correct. The breakeven point in units equals total fixed costs divided by the unit contribution margin. The UCM is $225 ($405,000 total contribution margin ÷ 1,800 tons sold), and the breakeven point is 1,100 tons ($247,500 ÷ $225).
Answer (C) is incorrect because Using variable costs in the denominator instead of contribution margin results in 900 tons.
Answer (D) is incorrect because This amount is half of the breakeven level.

Dimmell is considering replacing a highly labor intensive process with an automatic machine. This would result in an increase of $58,500 annually in manufacturing fixed costs. The variable manufacturing costs would decrease $25 per ton.

The new breakeven volume in tons would be

A. 990 tons.
B. 1,224 tons.
C. 1,854 tons.
D. 612 tons.
Answer (A) is incorrect because Ignoring the increase in fixed costs results in 990 tons.
Answer (B) is correct. The new manufacturing fixed cost is $306,000. The new contribution margin is $250 per unit, which is the old contribution margin of $225 plus the $25 of variable cost savings per ton. Thus, the new fixed costs of $306,000 divided by the new $250 contribution margin per unit produces a new breakeven point of 1,224 tons.
Answer (C) is incorrect because This amount would produce a profit.
Answer (D) is incorrect because This amount is half the breakeven level.

Tonykinn Company is contemplating marketing a new product. Fixed costs will be $800,000 for production of 75,000 units or less and $1,200,000 if production exceeds 75,000 units. The variable cost ratio is 60% for the first 75,000 units. Variable costs will decrease to 50% of sales for units in excess of 75,000. If the product is expected to sell for $25 per unit, how many units must Tonykinn sell to break even?

A. 120,000  
B. 111,000  
C. 96,000  
D. 80,000

Answer (A) is incorrect because Only the first 75,000 units have a UCM of $10. Additional units in excess of 75,000 have a UCM of $12.50.
Answer (B) is correct. The BEP in units is equal to fixed cost divided by the difference between unit selling price and unit variable cost (the unit contribution margin). At less than 75,000 units, fixed costs are $800,000 and UCM is $10 ($25 – ($25 × 60%)). At this UCM, 80,000 units ($800,000 ÷ $10) must be sold, but this volume is not within the relevant range. At any production level greater than 75,000 units, total fixed costs are $1,200,000 but there are two UCM layers. The first 75,000 units sold will produce a contribution margin of $750,000 (75,000 × $10). Hence, another $450,000 ($1,200,000 – $750,000) must be contributed. The UCM is $12.50 ($25 – ($25 × 50%)) for units in excess of 75,000, and 36,000 ($450,000 ÷ $12.50) additional units must be sold. Total unit sales at the BEP are 111,000 (75,000 + 36,000).
Answer (C) is incorrect because The first 75,000 units have a UCM of only $10.
Answer (D) is incorrect because Production of units in excess of 75,000 units will increase fixed costs from $800,000 to $1,200,000.

The Childers Company breaks even at an annual sales volume of 75,000 units. Actual annual sales volume was 100,000 units, and the company reported operating income of $200,000. The annual fixed costs for the Childers Company are

A. $800,000  
B. $600,000  
C. $75,000  
D. Insufficient information to determine amount of fixed costs.

Answer (A) is incorrect because The contribution margin of sales of 100,000 units is $800,000.
Answer (B) is correct. Operating income increased by $200,000 when the sales volume exceeded the BEP by 25,000 units. This increase in profit is a result of an increase in the contribution margin (sales – variable costs). Unit contribution margin is $8 ($200,000 ÷ 25,000 units). The BEP in units is equal to fixed costs divided by the UCM.

\[
\text{Fixed costs ÷ UCM} = \text{BEP} \\
\text{Fixed costs ÷ 8} = \text{75,000} \\
\text{Fixed costs} = \text{600,000}
\]
Answer (C) is incorrect because the annual fixed costs are determined by finding the UCM ($200,000 profit ÷ 25,000 increase in units over breakeven point) and multiplying it by the number of units at the breakeven point.

Answer (D) is incorrect because there is sufficient information to determine the amount of fixed costs. The annual fixed costs are determined by finding the UCM ($200,000 profit ÷ 25,000 increase in units over breakeven point) and multiplying it by the number of units at the breakeven point.

**Fact Pattern #92**
A company has sales of one of its products of $400,000 per year and a contribution margin ratio of 20%. Its margin of safety is $40,000.

**Refer to Fact Pattern #92**
What is the company’s breakeven point?

A. $360,000
B. $320,000
C. $288,000
D. $80,000

- Answer (A) is correct. The margin of safety equals sales above the breakeven point. Thus, if the margin of safety is $40,000, the breakeven point must be $360,000 ($400,000 sales – $40,000).
- Answer (B) is incorrect because the breakeven point in dollars is the difference between actual sales and the margin of safety.
- Answer (C) is incorrect because the breakeven point in dollars is the difference between actual sales and the margin of safety.
- Answer (D) is incorrect because the breakeven point in dollars is the difference between actual sales and the margin of safety.

**Refer to Fact Pattern #92**
What are the company’s fixed costs?

A. $72,000
B. $80,000
C. $288,000
D. $320,000

- Answer (A) is correct. The margin of safety equals sales above the breakeven point. Thus, if the margin of safety is $40,000, the breakeven point in sales dollars must be $360,000. If the contribution margin ratio is 20%, the contribution margin (sales – variable costs) at the breakeven point is $72,000 ($360,000 × 20%). This amount must equal fixed costs because sales equal the sum of fixed and variable costs at the breakeven point.
- Answer (B) is incorrect because not subtracting the margin of safety from sales results in $80,000.
- Answer (C) is incorrect because total variable costs equals $288,000.
- Answer (D) is incorrect because this amount equals total variable costs if $400,000 is the breakeven point.
[Fact Pattern #93]
For one of its divisions, Buona Fortuna Company has fixed costs of $300,000 and a variable-cost percentage equal to 60% of its $10 per unit selling price. It would like to earn a pre-tax income of $90,000 per year from the division.

[1046](Refers to Fact Pattern #93)
What is the breakeven point in dollars?

A. $300,000
B. $500,000
C. $750,000
D. $1,050,000

- Answer (A) is incorrect because This amount equals fixed costs.
- Answer (B) is incorrect because This amount is based on the variable-cost percentage.
- Answer (C) is correct. The breakeven point in dollars equals total fixed costs ($300,000) divided by the contribution margin percentage (40%), for a breakeven point of $750,000.
- Answer (D) is incorrect because Adding fixed costs to the breakeven level results in $1,050,000.

[1047]Oak Fine Furnishings manufactures a wide range of home furnishings. One of their products is an oak headboard. The company currently sells 4,000 headboards at an average price of $100 per unit. To manufacture the headboards, the variable costs are $55 per unit and the total fixed cost assigned to the oak headboards is $150,000. If the sale of headboards increases by 50% and all else remains constant, this would result in

A. A gross margin of $380,000.
B. A 50% increase in earnings before interest and taxes.
C. Fixed costs of $225,000.
D. Earnings before interest and taxes of $120,000.

- Answer (A) is incorrect because The amount of $380,000 is not the correct value for gross margin in this situation.
- Answer (B) is incorrect because The EBIT before the increase in production is $30,000, calculated as follows:
  
  
  \[ ($100 \times 4,000) - ($55 \times 4,000) - 150,000 = 30,000 \]

  The increase in EBIT from $30,000 to $120,000 represents a tripling ($120,000 – $30,000 ÷ $30,000), not a 50% increase.
- Answer (C) is incorrect because The question states that all else remains constant in the problem except the production of headboards. Accordingly, fixed costs would remain $150,000.
- Answer (D) is correct. Earnings before interest and taxes (EBIT) = Revenue – COGS – Operating Expenses – Depreciation and Amortization. If the sale of headboards increases by 50%, Oak Fine Furnishings will now sell 6,000 headboards (4,000 × 1.5). Given the sale of 6,000 headboards, EBIT is calculated as follows:
  
  \[ ($100 \times 6,000) - ($55 \times 6,000) - 150,000 = 120,000 \]
Starlight Theater stages a number of summer musicals at its theater in northern Ohio. Preliminary planning has just begun for the upcoming season, and Starlight has developed the following estimated data:

<table>
<thead>
<tr>
<th>Production</th>
<th>Number of Performances</th>
<th>Average Attendance per Performance</th>
<th>Ticket Price</th>
<th>Variable Costs</th>
<th>Fixed Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Wonderful</td>
<td>12</td>
<td>3,500</td>
<td>$18</td>
<td>$3</td>
<td>$165,000</td>
</tr>
<tr>
<td>That’s Life</td>
<td>20</td>
<td>3,000</td>
<td>15</td>
<td>1</td>
<td>249,000</td>
</tr>
<tr>
<td>All That Jazz</td>
<td>12</td>
<td>4,000</td>
<td>20</td>
<td>0</td>
<td>316,000</td>
</tr>
</tbody>
</table>

1. Represent payments to production companies and are based on tickets sold.
2. Costs directly associated with the entire run of each production for costumes, sets, and artist fees.

Starlight will also incur $565,000 of common fixed operating charges (administrative overhead, facility costs, and advertising) for the entire season and is subject to a 30% income tax rate.

If Starlight’s schedule of musicals is held, as planned, how many patrons would have to attend for Starlight to break even during the summer season?

A. 77,918
B. 79,302
C. 79,938
D. 81,344

Answer (A) is incorrect because the figure 77,918 results from weighting the shows’ contribution margins by their relative proportions of the average attendance rather than the number of tickets sold.

Answer (B) is incorrect because the figure 79,302 results from simply weighting each of the shows’ contribution margins by 1/3 rather than by their relative proportions of ticket sales.

Answer (C) is correct. Starlight can calculate the weights for a composite ticket as follows:

<table>
<thead>
<tr>
<th>Production</th>
<th>Number of Performances</th>
<th>Average Attendance per Performance</th>
<th>Ticket Price</th>
<th>Variable Costs</th>
<th>Contribution Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Wonderful</td>
<td>12</td>
<td>3,500</td>
<td>$18</td>
<td>$3</td>
<td>$15</td>
</tr>
<tr>
<td>That’s Life</td>
<td>20</td>
<td>3,000</td>
<td>15</td>
<td>1</td>
<td>$14</td>
</tr>
<tr>
<td>All That Jazz</td>
<td>12</td>
<td>4,000</td>
<td>20</td>
<td>0</td>
<td>$20</td>
</tr>
</tbody>
</table>

The weighted UCM can now be calculated:

<table>
<thead>
<tr>
<th>Production</th>
<th>Ticket Price</th>
<th>Contribution Margin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Wonderful</td>
<td>$18</td>
<td>$15</td>
</tr>
<tr>
<td>That’s Life</td>
<td>$15</td>
<td>$14</td>
</tr>
<tr>
<td>All That Jazz</td>
<td>$20</td>
<td>$20</td>
</tr>
</tbody>
</table>

Total: $62

The total fixed costs that must be allocated are $1,295,000 ($165,000 + $249,000 + $316,000 + $565,000). The break even point in composite tickets, calculated as total fixed costs divided by the unit contribution margin, is thus 79,938 (1,295,000 ÷ $62).

Answer (D) is incorrect because the figure 81,344 results from weighting the shows’ contribution margins by their relative proportions of the number of performances rather than the number of tickets sold.
[Fact Pattern #95]
Gleason Co. has two products, a frozen dessert and ready-to-bake breakfast rolls, ready for introduction. However, plant capacity is limited, and only one product can be introduced at present. Therefore, Gleason has conducted a market study, at a cost of $26,000, to determine which product will be more profitable. The results of the study follow.

<table>
<thead>
<tr>
<th>Sales of Desserts at $1.80/unit</th>
<th>Sales of Rolls at $1.20/unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>Probability</td>
</tr>
<tr>
<td>250,000</td>
<td>.30</td>
</tr>
<tr>
<td>300,000</td>
<td>.40</td>
</tr>
<tr>
<td>350,000</td>
<td>.20</td>
</tr>
<tr>
<td>400,000</td>
<td>.10</td>
</tr>
</tbody>
</table>

The costs associated with the two products have been estimated by Gleason’s cost accounting department and are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Dessert</th>
<th>Rolls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients per unit</td>
<td>$ .40</td>
<td>$ .25</td>
</tr>
<tr>
<td>Direct labor per unit</td>
<td>.35</td>
<td>.30</td>
</tr>
<tr>
<td>Variable overhead per unit</td>
<td>.40</td>
<td>.20</td>
</tr>
<tr>
<td>Production tooling*</td>
<td>48,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Advertising</td>
<td>30,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

*Gleason treats production tooling as a current operating expense rather than capitalizing it as a fixed asset.

[1049] Refers to Fact Pattern #95

In order to recover the costs of production tooling and advertising for the breakfast rolls, Gleason’s sales of the breakfast rolls would have to be

A. 37,500 units.
B. 100,000 units.
C. 60,000 units.
D. Some amount other than those given.

- Answer (A) is incorrect because Dividing $45,000 fixed costs by $1.20 selling price results in 37,500 units.
- Answer (B) is correct. Fixed costs of $45,000 ($25,000 + $20,000) should be divided by the unit contribution margin of $.45 ($1.20 selling price – $.25 – $.30 – $.20). The unit breakeven point is therefore 100,000 units ($45,000 ÷ $.45).
- Answer (C) is incorrect because Dividing $45,000 fixed costs by $.75 ($1.20 – .25 – .20) results in 60,000 units. The direct labor per unit should also be subtracted from the selling price.
- Answer (D) is incorrect because The sales would have to be 100,000 units.
[Fact Pattern #96]
Madengrad Company manufactures a single electronic product called Precisionmix. This unit is a batch-density monitoring device attached to large industrial mixing machines used in flour, rubber, petroleum, and chemical manufacturing. Precisionmix sells for $900 per unit. The following variable costs are incurred to produce each Precisionmix device:

- **Direct labor**: $180
- **Direct materials**: $240
- **Factory overhead**: $105
  - **Variable production costs**: $525
  - **Marketing costs**: $75
- **Total variable costs**: $600

Madengrad’s income tax rate is 40%, and annual fixed costs are $6,600,000. Except for an operating loss incurred in the year of incorporation, the firm has been profitable over the last 5 years.

[1050] (Refers to Fact Pattern #96)

For Madengrad Company to achieve an after-tax net income of $540,000, annual sales revenue must be

A. $23,850,000  
B. $22,500,000  
C. $21,420,000  
D. $2,700,000

- **Answer (A)** is incorrect because the amount of $23,850,000 results from dividing the target net income by the tax rate rather than 1 minus the tax rate.
- **Answer (B)** is **correct**. Madengrad’s contribution margin ratio (CMR) is 33.3% \([($900 \text{ selling price} - $600 \text{ variable costs}) / $900 \text{ selling price}]\). The dollar sales required to achieve a given level of after-tax income can be calculated as follows:

  \[
  \text{Target dollar sales} = \frac{\text{Fixed costs} + \left[\text{Target net income} / (1.0 - .40)\right]}{\text{CMR}}
  \]

  \[
  = \frac{[$6,600,000 + ($540,000 / .60)] / .33333333}{.33333333}
  \]

  \[
  = ($6,600,000 + $900,000) / .33333333
  \]

  \[
  = $22,500,000
  \]

- **Answer (C)** is incorrect because the amount of $21,420,000 results from failing to weight the target net income by 1 minus the tax rate.
- **Answer (D)** is incorrect because the amount of $2,700,000 results from failing to include the fixed costs in the numerator.
Fact Pattern #97
The data below pertain to the forecasts of XYZ Company for the upcoming year.

<table>
<thead>
<tr>
<th>Item</th>
<th>Total Cost</th>
<th>Unit Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (40,000 units)</td>
<td>$1,000,000</td>
<td>$25</td>
</tr>
<tr>
<td>Raw materials</td>
<td>160,000</td>
<td>4</td>
</tr>
<tr>
<td>Direct labor</td>
<td>280,000</td>
<td>7</td>
</tr>
<tr>
<td>Factory overhead:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>80,000</td>
<td>2</td>
</tr>
<tr>
<td>Fixed</td>
<td>360,000</td>
<td></td>
</tr>
<tr>
<td>Selling and general expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>120,000</td>
<td>3</td>
</tr>
<tr>
<td>Fixed</td>
<td>225,000</td>
<td></td>
</tr>
</tbody>
</table>

How many units does XYZ Company need to produce and sell to make a before-tax profit of 10% of sales?

A. 65,000 units.
B. 36,562 units.
C. 90,000 units.
D. 25,000 units.

- Answer (A) is incorrect because the breakeven point is 65,000 units.
- Answer (B) is incorrect because it produces a net loss.
- Answer (C) is correct. Revenue minus variable and fixed expenses equals net income. If X equals unit sales, revenue equals $25X, total variable expenses equal $16X ($4 + $7 + $2 + $3), total fixed expenses equal $585,000 ($360,000 + $225,000), and net income equals 10% of revenue. Hence, X equals 90,000 units.

\[
25X - 16X - 585,000 = 25X \times 10% \\
6.5X = 585,000 \\
X = 90,000 \text{ units}
\]

- Answer (D) is incorrect because the amount of 25,000 is the excess of the required units over the breakeven point.

Assuming that XYZ Company sells 80,000 units, what is the maximum that can be paid for an advertising campaign while still breaking even?

A. $135,000
B. $1,015,000
C. $535,000
D. $695,000
Answer (A) is correct. The company will break even when net income equals zero. Net income is equal to revenue minus variable expenses and fixed expenses, including advertising. Thus, if X equals advertising cost, the equation is

\[
\begin{align*}
(80,000)(25) - (80,000)(16) - 585,000 - X &= 0 \\
2,000,000 - 1,280,000 - 585,000 - X &= 0 \\
X &= 135,000
\end{align*}
\]

- Answer (B) is incorrect because the unit variable expenses are $16.
- Answer (C) is incorrect because the unit variable expenses are $16.
- Answer (D) is incorrect because the unit variable expenses are $16.

Total production costs of prior periods for a company are listed as follows. Assume that the same cost behavior patterns can be extended linearly over the range of 3,000 to 35,000 units and that the cost driver for each cost is the number of units produced.

<table>
<thead>
<tr>
<th>Production in Units per Month</th>
<th>3,000</th>
<th>9,000</th>
<th>16,000</th>
<th>35,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost X</td>
<td>$23,700</td>
<td>$52,680</td>
<td>$86,490</td>
<td>$178,260</td>
</tr>
<tr>
<td>Cost Y</td>
<td>47,280</td>
<td>141,840</td>
<td>252,160</td>
<td>551,600</td>
</tr>
</tbody>
</table>

The company is concerned about its current operating performance that is summarized as follows.

Sales ($12.50 per unit) $300,000
Variable costs 180,000
Net operating loss (40,000)

How many additional units should have been sold in order for the company to break even?

A. 32,000 units.  
B. 16,000 units.  
C. 12,800 units.  
D. 8,000 units.

- Answer (A) is incorrect because the breakeven sales volume is 32,000.
- Answer (B) is incorrect because the amount of 16,000 treats the NOL as a net operating profit.
- Answer (C) is incorrect because fixed costs divided by unit sales price equals 12,800.
- Answer (D) is correct. The breakeven point in units equals fixed costs divided by the difference between unit price and unit variable cost. Fixed costs were $160,000 [($300,000 sales - $180,000 VC) + $40,000 NOL], units sold equaled 24,000 ($300,000 sales ÷ $12.50 SP), and unit variable cost was $7.50 ($180,000 VC ÷ 24,000 units sold). Accordingly, the breakeven point in units was 32,000 [($160,000 FC ÷ ($12.50 SP - $7.50 unit VC)], and the additional units that should have been sold to break even equaled 8,000 (32,000 - 24,000).
Associated Supply, Inc., is considering introducing a new product that will require a $250,000 investment of capital. The necessary funds would be raised through a bank loan at an interest rate of 8%. The fixed operating costs associated with the product would be $122,500, while the contribution margin percentage would be 42%. Assuming a selling price of $15 per unit, determine the number of units (rounded to the nearest whole unit) Associated would have to sell to generate earnings before interest and taxes (EBIT) of 32% of the amount of capital invested in the new product.

A. 35,318 units.
B. 32,143 units.
C. 25,575 units.
D. 23,276 units.

- Answer (A) is incorrect because improperly including interest as a fixed cost results in 35,318.
- Answer (B) is correct.
- Answer (C) is incorrect because improperly including interest as a fixed cost and using the cost percentage in the calculation instead of the contribution margin percentage results in 25,575.
- Answer (D) is incorrect because improperly using the complement of the contribution margin percentage instead of the contribution margin percentage results in 23,276.

**Fact Pattern #98**

Delphi Company has developed a new project that will be marketed for the first time during the next fiscal year. Although the Marketing Department estimates that 35,000 units could be sold at $36 per unit, Delphi’s management has allocated only enough manufacturing capacity to produce a maximum of 25,000 units of the new product annually. The fixed costs associated with the new product are budgeted at $450,000 for the year, which includes $60,000 for depreciation on new manufacturing equipment.

Data associated with each unit of product are presented as follows. Delphi is subject to a 40% income tax rate.

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct material</td>
<td>$ 7.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>3.50</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>4.00</td>
</tr>
<tr>
<td>Variable manufacturing cost</td>
<td>$14.50</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>1.50</td>
</tr>
<tr>
<td>Total variable cost</td>
<td>$16.00</td>
</tr>
</tbody>
</table>

**[1055] Refers to Fact Pattern #98**

The maximum after-tax profit that can be earned by Delphi Company from sales of the new product during the next fiscal year is

A. $30,000
B. $50,000
C. $110,000
D. $66,000
Answer (A) is correct. Delphi’s breakeven point is 22,500 units ($450,000 fixed costs ÷ $20 UCM). The unit contribution margin (UCM) is $20 ($36 selling price – $16 unit variable costs). At the breakeven point, all fixed costs have been recovered. Hence, pretax profit equals the unit contribution margin times unit sales in excess of the breakeven point, or $50,000 [(25,000 unit sales – 22,500 BEP) × $20 UCM]. After-tax profit is $30,000 [$50,000 × (1.0 – .40)].

- Answer (B) is incorrect because this amount is the pre-tax profit.
- Answer (C) is incorrect because this amount fails to include depreciation as a fixed cost and ignores income taxes.
- Answer (D) is incorrect because this amount fails to include depreciation as a fixed cost.

[1056] (Refers to Fact Pattern #98)

Delphi Company’s management has stipulated that it will not approve the continued manufacture of the new product after the next fiscal year unless the after-tax profit is at least $75,000 the first year. The unit selling price to achieve this target profit must be at least

A. $37.00
B. $36.60
C. $34.60
D. $39.00

- Answer (A) is incorrect because the amount of $37.00 does not consider income taxes.
- Answer (B) is incorrect because the amount of $36.60 excludes depreciation.
- Answer (C) is incorrect because the amount of $34.60 does not include depreciation or taxes.
- Answer (D) is correct. If X represents the necessary selling price, 25,000 equals maximum sales volume, $16 is the variable cost per unit, $450,000 is the total fixed cost, and $125,000 ($75,000 target after-tax profit ÷ (1.0 – .40)) is the desired pre-tax profit, the following formula may be solved to determine the requisite unit price:

\[25,000 (X – \$16) – \$450,000 = \$125,000\]
\[25,000X – \$400,000 – \$450,000 = \$125,000\]
\[25,000X = \$975,000\]
\[X = \$39\]

[Fact Pattern #99]

Bruell Electronics Co. is developing a new product, surge protectors for high-voltage electrical flows. The cost information below relates to the product:

<table>
<thead>
<tr>
<th>Unit Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$3.25</td>
</tr>
<tr>
<td>Direct labor</td>
<td>4.00</td>
</tr>
<tr>
<td>Distribution</td>
<td>.75</td>
</tr>
</tbody>
</table>

The company will also be absorbing $120,000 of additional fixed costs associated with this new product. A corporate fixed charge of $20,000 currently absorbed by other products will be allocated to this new product.
How many surge protectors (rounded to the nearest hundred) must Bruell Electronics sell at a selling price of $14 per unit to gain $30,000 additional income before taxes?

A. 10,700 units.
B. 12,100 units.
C. 20,000 units.
D. 25,000 units.

- Answer (A) is incorrect because this number of units is based on a UCM equal to selling price.
- Answer (B) is incorrect because a contribution margin of $6 per unit necessitates sales of 25,000 units to produce a $30,000 before-tax profit.
- Answer (C) is incorrect because this number of units is the breakeven point.
- Answer (D) is correct. The number of units to be sold to generate a specified pre-tax income equals the sum of total fixed costs and the targeted pre-tax income, divided by the unit contribution margin. Unit variable costs total $8 ($3.25 + $4.00 + $0.75), and UCM is $6 ($14 unit selling price – $8). Thus, the desired unit sales level equals 25,000 units (($120,000 + $30,000) ÷ $6).

How many surge protectors (rounded to the nearest hundred) must Bruell Electronics sell at a selling price of $14 per unit to increase after-tax income by $30,000? Bruell Electronics’ effective income tax rate is 40%.

A. 10,700 units.
B. 12,100 units.
C. 20,000 units.
D. 28,300 units.

- Answer (A) is incorrect because this number of units is based on a UCM equal to selling price and $30,000 of pretax income.
- Answer (B) is incorrect because a $6 UCM necessitates sales of 28,300 units to produce a $30,000 after-tax profit.
- Answer (C) is incorrect because this number of units is the breakeven point.
- Answer (D) is correct. The number of units to be sold to generate a specified pre-tax income equals the sum of total fixed costs and the targeted pre-tax income, divided by the unit contribution margin. Given a desired after-tax income of $30,000 and a tax rate of 40%, the targeted pre-tax income must be $50,000 ($30,000 ÷ (1.0 – .40)]. Unit variable costs total $8 ($3.25 + $4.00 + $.75), and UCM is $6 ($14 unit selling price – $8). Hence, the desired unit sales level is 28,333 (($120,000 + $50,000) ÷ $6). Rounded to the nearest hundred, the answer is $28,300.
BE&H Manufacturing is considering dropping a product line. It currently produces a multi-purpose woodworking clamp in a simple manufacturing process that uses special equipment. Variable costs amount to $6.00 per unit. Fixed overhead costs, exclusive of depreciation, have been allocated to this product at a rate of $3.50 a unit and will continue whether or not production ceases. Depreciation on the special equipment amounts to $20,000 a year. If production of the clamp is stopped, the special equipment can be sold for $18,000; if production continues, however, the equipment will be useless for further production at the end of 1 year and will have no salvage value. The clamp has a selling price of $10 a unit. Ignoring tax effects, the minimum number of units that would have to be sold in the current year to break even on a cash flow basis is

A. 4,500 units.  
B. 5,000 units.  
C. 20,000 units.  
D. 36,000 units.

- Answer (A) is correct. The BEP in units is equal to fixed costs divided by the unit contribution margin ($10 unit selling price – $6 unit variable cost). The $18,000 salvage value, the cash flow that would be received if production is discontinued, is treated as a fixed cost. Hence, the number of units that must be sold to break even on continuation of the product line is 4,500 [$18,000 fixed costs ÷ ($10 – $6)]. Fixed overhead allocated is not considered in this calculation because it is not a cash flow and will continue regardless of the decision.  
- Answer (B) is incorrect because the BEP is equal to the salvage value (not depreciation) divided by the UCM of $4 ($10 – $6). Depreciation is a non-cash flow and therefore should not be considered in the cash flow breakeven point calculation.  
- Answer (C) is incorrect because the BEP is equal to the salvage value (not depreciation) divided by the UCM of $4 ($10 – $6). Depreciation is a non-cash flow and therefore should not be considered in the cash flow breakeven point calculation.  
- Answer (D) is incorrect because unit fixed costs should not be subtracted in determining the unit contribution margin. The fixed costs will continue regardless so they are not included in the calculation. Therefore, the $18,000 salvage value will be divided by the $4 unit contribution margin in determining the cash flow breakeven point in units.

Austin Manufacturing, which is subject to a 40% income tax rate, had the following operating data for the period just ended.

Selling price per unit $60  
Variable cost per unit $22  
Fixed costs $504,000

Management plans to improve the quality of its sole product by (1) replacing a component that costs $3.50 with a higher-grade unit that costs $5.50, and (2) acquiring a $180,000 packing machine. Austin will depreciate the machine over a 10-year life with no estimated salvage value by the straight-line method of depreciation. If the company wants to earn after-tax income of $172,800 in the upcoming period, it must sell

A. 19,300 units.  
B. 21,316 units.  
C. 22,500 units.  
D. 23,800 units.

- Answer (A) is incorrect because this number of units does not take income taxes into consideration.  
- Answer (B) is incorrect because this number of units fails to consider the increased variable costs from the introduction of the higher-priced component.
Answer (C) is correct. The units to be sold equal fixed costs plus the desired pretax profit, divided by the unit contribution margin. In the preceding year, the unit contribution margin is $38 ($60 selling price – $22 unit variable cost). That amount will decrease by $2 to $36 in the upcoming year because of use of a higher-grade component. Fixed costs will increase from $504,000 to $522,000 as a result of the $18,000 ($180,000 ÷ 10 years) increase in fixed costs attributable to depreciation on the new machine. Dividing the $172,800 of desired after-tax income by 60% (the complement of the tax rate) produces a desired before-tax income of $288,000. Hence, the breakeven point in units is 22,500 \[ \left( \frac{522,000 + 288,000}{36} \right) \].

Answer (D) is incorrect because This number of units does not take income taxes into consideration, and it includes the entire cost of the new machine as a fixed cost.

A company has just completed the final development of its only product, general recombinant bacteria, which can be programmed to kill most insects before dying themselves. The product has taken 3 years and $6,000,000 to develop. The following costs are expected to be incurred on a monthly basis for the normal production level of 1,000,000 pounds of the new product:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$300,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>Variable factory overhead</td>
<td>$450,000</td>
</tr>
<tr>
<td>Fixed factory overhead</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Variable selling, general, and</td>
<td>$900,000</td>
</tr>
<tr>
<td>administrative expenses</td>
<td></td>
</tr>
<tr>
<td>Fixed selling, general, and</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>administrative expenses</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$6,400,000</td>
</tr>
</tbody>
</table>

At a sales price of $5.90 per pound, the sales in pounds necessary to ensure a $3,000,000 profit the first year would be (to the nearest thousand pounds)

A. 13,017,000 pounds.
B. 14,000,000 pounds.
C. 15,000,000 pounds.
D. 25,600,000 pounds.

Answer (A) is incorrect because The sales necessary to ensure a $3,000,000 profit is 15,000,000 pounds.

Answer (B) is incorrect because The breakeven point is 14,000,000 pounds.

Answer (C) is correct. In breakeven analysis, total revenue equals fixed costs plus variable costs. If a given profit is desired, it is treated as a fixed cost. Exclusive of profit, the annual fixed cost is $42,000,000 ($3,500,000 per month of fixed factory overhead and SG&A expense × 12 months). The variable cost per pound is $2.90 \[ \left( \frac{$300,000 + $1,250,000 + $450,000 + $900,000}{1,000,000} \right) \]. If X equals sales in pounds, the level of sales needed to earn a $3,000,000 profit is

\[
\begin{align*}
5.90X &= 3,000,000 + 42,000,000 + 2.90X \\
3X &= 45,000,000 \\
X &= 15,000,000\text{ pounds}
\end{align*}
\]

This analysis assumes that no additional costs are incurred when production exceeds the normal level of 1,000,000 pounds per month.

Answer (D) is incorrect because The sales necessary to ensure a $3,000,000 profit is 15,000,000 pounds.
[Fact Pattern #100]
A company that sells its single product for $40 per unit had after-tax net income for the past year of $1,188,000 after applying an effective tax rate of 40%. The projected costs for manufacturing and selling its single product in the coming year are listed below.

Variable costs per unit:
- Direct material: $5.00
- Direct labor: 4.00
- Manufacturing overhead: 6.00
- Selling and administrative costs: 3.00
Total variable cost per unit: $18.00

Annual fixed operating costs:
- Manufacturing overhead: $6,200,000
- Selling and administrative costs: 3,700,000
Total annual fixed cost: $9,900,000

The dollar sales volume required in the coming year to earn the same after-tax net income as the past year is

A. $20,160,000  
B. $21,600,000  
C. $23,400,000  
D. $26,400,000

- Answer (A) is incorrect because Not adjusting after-tax net income to pretax net income results in $20,160,000.
- Answer (B) is correct. The desired after-tax net income is $1,188,000 (the past year’s amount). Given a 40% tax rate, the pretax equivalent is $1,980,000 [$1,188,000 ÷ (1.0 – .40)]. Pretax net income equals dollar sales (unit sales × $40), minus total fixed costs, minus total variable costs (unit sales × unit variable cost). Hence, the contribution margin (sales – variable costs) is equated with the sum of fixed costs and the targeted pretax net income. Unit sales (S) equal 540,000, and sales dollars equal $21,600,000 ($40,000 units × $40).

\[
\begin{align*}
$40S - 9,900,000 & - 18S = 1,980,000 \\
S &= 540,000 units
\end{align*}
\]

- Answer (C) is incorrect because Adjusting after-tax net income by dividing by the tax rate rather than one minus the tax rate results in $23,400,000.
- Answer (D) is incorrect because Equating the sum of the desired pretax net income and total fixed costs with total variable costs instead of the contribution margin results in $26,400,000.
The company has learned that a new direct material is available that will increase the quality of its product. The new material will increase the direct material costs by $3 per unit. The company will increase the selling price of the product to $50 per unit and increase its marketing costs by $1,575,000 to advertise the higher-quality product. The number of units the company has to sell in order to earn a 10% before-tax return on sales would be

A. 337,500 units.
B. 346,875 units.
C. 425,000 units.
D. 478,125 units.

- Answer (A) is incorrect because Using the wrong sign for the pretax net income results in 337,500 units.
- Answer (B) is incorrect because Subtracting, not adding, the incremental marketing costs to determine total fixed costs results in 346,875 units.
- Answer (C) is incorrect because Failing to adjust for the increase in direct materials costs results in 425,000 units.
- Answer (D) is correct. Pretax net income (10% of dollar sales) equals dollar sales (unit sales × $50), minus total fixed costs (increased by $1,575,000 of marketing costs), minus total variable costs (increased by $3 per unit). Unit sales (S) therefore equal 478,125 units.

\[
0.10(50S) = 50S - (9,900,000 + 1,575,000) - (18 + 3)S \\
24S = 11,475,000 \\
S = 478,125 \text{ units}
\]
Orange Company’s controller developed the following direct-costing income statement for Year 1:

<table>
<thead>
<tr>
<th>Per Unit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (150,000 units at $30)</td>
<td>$ 4,500,000</td>
</tr>
<tr>
<td>Variable costs:</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td>$1,050,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>1,500,000</td>
</tr>
<tr>
<td>Mfg. overhead</td>
<td>300,000</td>
</tr>
<tr>
<td>Selling &amp; mktg.</td>
<td>300,000</td>
</tr>
<tr>
<td>(3,150,000)</td>
<td>(21)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$ 1,350,000</td>
</tr>
<tr>
<td>Fixed costs:</td>
<td></td>
</tr>
<tr>
<td>Mfg. overhead</td>
<td>$ 600,000</td>
</tr>
<tr>
<td>Selling &amp; mktg.</td>
<td>300,000</td>
</tr>
<tr>
<td>(900,000)</td>
<td>(6)</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 450,000</td>
</tr>
</tbody>
</table>

Orange Co. based its next year’s budget on the assumption that fixed costs, unit sales, and the sales price would remain as they were in Year 1, but with operating income being reduced to $300,000. By July of Year 2, the controller was able to predict that unit sales would increase over Year 1 levels by 10%. Based on the Year 2 budget and the new information, the predicted Year 2 operating income would be

A. $300,000  
B. $330,000  
C. $420,000  
D. $585,000  

- Answer (A) is incorrect because This amount is the projected net income before the increase in sales.  
- Answer (B) is incorrect because The amount of $330,000 takes into account a 10% increase in fixed costs to $990,000 when the fixed costs did not increase.  
- Answer (C) is correct. Since fixed costs, unit sales, and sales price are projected to remain the same, and operating income will be reduced, the variable costs must increase. If the July Year 2 prediction that unit sales will increase by 10% from 150,000 to 165,000 is based on the budgeted FC, sales price, and VC, predicted operating income can be calculated as follows:

\[
\text{Contribution margin} - \text{Fixed costs} = \text{Operating income} \\
\text{CM} - \text{FC} = \$300,000 \\
\text{CM} - \$900,000 = \$300,000 \\
\text{CM} = \$1,200,000 \\
\text{Budgeted UCM} = \$1,200,000 ÷ 150,000 \text{ units} = \$8 \\
\text{Total CM} = 165,000 \text{ units} \times \$8 = \$ 1,320,000 \\
\text{FC} = \frac{\$900,000}{900,000} \\
\text{Operating income} = \frac{\$ 420,000}{420,000} \\
\]

- Answer (D) is incorrect because The UCM for year 2 is $8 per unit, not $9.
A manufacturer produces a product that sells for $10 per unit. Variable costs per unit are $6 and total fixed costs are $12,000. At this selling price, the company earns a profit equal to 10% of total dollar sales. By reducing its selling price to $9 per unit, the manufacturer can increase its unit sales volume by 25%. Assume that there are no taxes and that total fixed costs and variable costs per unit remain unchanged. If the selling price were reduced to $9 per unit, the profit would be

A. $3,000  
B. $4,000  
C. $5,000  
D. $6,000

- Answer (A) is correct. To determine the profit under the new pricing policy, the sales volume under the old policy must be calculated.

\[ \text{Sales Volume (old policy)} = \frac{10X - 6X - 12,000}{0.1(10X)} \]
\[ X = 4,000 \text{ units} \]

The expected volume at the new price of $9 is 5,000 units (4,000 \times 1.25\%), and the new profit is $3,000 [(5,000 \times $9) - (5,000 \times $6) - $12,000].

- Answer (B) is incorrect because the sales volume under the old policy is 4,000 units \([10X - 6X - 12,000 - 0.1(10X)]\). The sales will increase 25\% when the price is lowered to $9; thus, the new volume is 5,000 units (4,000 \times 1.25\%) and the profit would be $3,000.

- Answer (C) is incorrect because the sales volume under the old policy is 4,000 units \([10X - 6X - 12,000 - 0.1(10X)]\). The sales will increase 25\% when the price is lowered to $9; thus, the new volume is 5,000 units (4,000 \times 1.25\%) and the profit would be $3,000.

- Answer (D) is incorrect because the sales volume under the old policy is 4,000 units \([10X - 6X - 12,000 - 0.1(10X)]\). The sales will increase 25\% when the price is lowered to $9; thus, the new volume is 5,000 units (4,000 \times 1.25\%) and the profit would be $3,000.

Moorehead Manufacturing Company produces two products for which the data presented to the right have been tabulated. Fixed manufacturing cost is applied at a rate of $1.00 per machine hour. The sales manager has had a $160,000 increase in the budget allotment for advertising and wants to apply the money to the most profitable product. The products are not substitutes for one another in the eyes of the company’s customers.

<table>
<thead>
<tr>
<th>Per Unit</th>
<th>XY-7</th>
<th>BD-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$4.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>Variable manuf.</td>
<td>2.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Fixed manuf.</td>
<td>.75</td>
<td>.20</td>
</tr>
<tr>
<td>Variable sell.</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Suppose the sales manager chooses to devote the entire $160,000 to increased advertising for XY-7. The minimum increase in sales units of XY-7 required to offset the increased advertising is

A. 640,000 units.  
B. 160,000 units.  
C. 128,000 units.  
D. 80,000 units.
● Answer (A) is incorrect because this number of units would be the result if the UCM for XY-7 were $.25 instead of $1.00 (640,000 × $.25 = $160,000). Fixed manufacturing costs are not included in determining UCM.

● Answer (B) is correct. The contribution margin (CM) for XY-7 is $1 per unit ($4 selling price – $3 unit variable cost). Thus, 160,000 units of XY-7 will generate an additional $160,000 of CM, which is sufficient to cover the increase in advertising costs.

● Answer (C) is incorrect because this number of units implies a $1.25 UCM. Variable selling costs are included and fixed manufacturing costs are not included in determining UCM.

● Answer (D) is incorrect because this number of units implies a $2.00 UCM. The correct UCM of $1.00 is found by subtracting all variable costs from the selling price.

[1067] Refers to Fact Pattern #101

Suppose the sales manager chooses to devote the entire $160,000 to increased advertising for BD-4. The minimum increase in sales dollars of BD-4 required to offset the increased advertising would be

A. $160,000  
B. $320,000  
C. $960,000  
D. $1,600,000

● Answer (A) is incorrect because a $1 increase in sales does not result in a $1 increase in profits. Variable costs of producing the units must be deducted in order to determine the contribution margin derived from each unit sold.

● Answer (B) is incorrect because the number 320,000 is the number of sales units, not sales dollars, needed to offset the increased advertising costs.

● Answer (C) is correct. Sales dollars must increase sufficiently to cover the $160,000 increase in advertising. The unit contribution margin for BD-4 is $0.50 ($3 selling price – $2.50 variable costs), and the CMR is 1/6 (UCM ÷ $3 selling price). Dividing the $160,000 by 1/6 gives the sales dollars necessary to generate a CM of $960,000 ($160,000 ÷ 1/6 = $960,000).

● Answer (D) is incorrect because fixed manufacturing costs are not included in determining unit contribution margin.

[Fact Pattern #102]

Oradell Company sells its single product at a price of $60 per unit and incurs the following variable costs per unit of product:

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct material</td>
<td>$16</td>
</tr>
<tr>
<td>Direct labor</td>
<td>12</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>7</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$35</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>5</td>
</tr>
<tr>
<td>Total variable costs</td>
<td>$40</td>
</tr>
</tbody>
</table>

Oradell’s annual fixed costs are $880,000, and Oradell is subject to a 30% income tax rate.
A production and sales volume of 4,000 units of product per month would result in an annual after-tax income (loss) for Oradell Company of

A. $80,000  
B. $(80,000)  
C. $56,000  
D. $(560,000)

- Answer (A) is incorrect because this amount is the income before the tax expense of $(24,000) ($80,000 × 30%).
- Answer (B) is incorrect because this amount is the pre-tax loss if sales volume per year (instead of per month) were 4,000 units.
- Answer (C) is correct. The income statement for a volume of 48,000 units (4,000 per month × 12 months) would appear as follows.

<table>
<thead>
<tr>
<th>Sales ($60 per unit)</th>
<th>$2,880,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable manufacturing ($35 per unit)</td>
<td>(1,680,000)</td>
</tr>
<tr>
<td>Variable selling ($5 per unit)</td>
<td>(240,000)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$ 960,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>(880,000)</td>
</tr>
<tr>
<td>Income before tax</td>
<td>$ 80,000</td>
</tr>
<tr>
<td>Tax expense (30%)</td>
<td>(24,000)</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 56,000</td>
</tr>
</tbody>
</table>

- Answer (D) is incorrect because this amount is the after-tax loss if annual sales were 4,000 units.

The annual sales revenue required by Oradell Company in order to achieve after-tax net income of $224,000 for the year is

A. $3,600,000  
B. $3,312,000  
C. $1,656,000  
D. $3,110,400

- Answer (A) is correct. Oradell’s contribution margin ratio (CMR) is 33.3% [(60 selling price – $40 unit variable cost) ÷ $60 selling price]. Treating desired after-tax profit as an additional fixed cost allows the target unit sales to be calculated as follows:

\[
\text{Target dollar sales} = \left( \text{Fixed costs} + \left[ \frac{\text{Target net income}}{(1.0 - .30)} \right] \right) \div \text{CMR}
\]

\[
= \left( $880,000 + \frac{($224,000 ÷ .70)}{.33333333} \right) ÷ .33333333
\]

\[
= \left( $880,000 + $320,000 \right) ÷ .33333333
\]

\[
= $3,600,000
\]

At a selling price of $60 each, the total revenue is $3,600,000 (60,000 units × $60).
- Answer (B) is incorrect because this amount is the annual sales revenue that results when the $96,000 of income tax is ignored.
- Answer (C) is incorrect because this amount is the annual sales revenue when the $96,000 of income tax is ignored and the sum of the fixed costs and net income ($1,104,000 = $880,000 fixed costs + $224,000 net income) is divided by the variable unit cost of $40 (instead of the contribution margin of $20).
Answer (D) is incorrect because this amount is the annual sales revenue when the $96,000 of income is subtracted from (instead of added to) the $224,000.

[Fact Pattern #103]
The budget data for the Bidwell Company appear below.

<table>
<thead>
<tr>
<th>Sales (100,000 units)</th>
<th>$1,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs:</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td>$ 0</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>100,000</td>
</tr>
<tr>
<td>Selling and admin.</td>
<td>110,000</td>
</tr>
<tr>
<td>Total costs</td>
<td>$210,000</td>
</tr>
<tr>
<td>Budgeted operating income</td>
<td></td>
</tr>
</tbody>
</table>

[1070] Refers to Fact Pattern #103
If the Bidwell Company is subject to an effective income tax rate of 40%, the number of units Bidwell must sell to earn an after-tax profit of $90,000 is

A. 100,000 units.
B. 120,000 units.
C. 102,858 units.
D. 145,000 units.

Answer (A) is incorrect because selling 100,000 units results from ignoring incomes.
Answer (B) is correct. Bidwell’s total contribution margin is $300,000 ($1,000,000 sales – $700,000 total variable costs), so its unit contribution margin (UCM) is $3 ($300,000 ÷ 100,000 units). Treating desired after-tax profit as an additional fixed cost allows the target unit sales to be calculated as follows:

\[
\text{Target unit sales} = \frac{\text{Fixed costs + [Target net income ÷ (1.0 – .40)]}}{\text{UCM}}
\]

\[
= \frac{[210,000 + (90,000 ÷ .60)]}{3}
\]

\[
= 120,000
\]

Answer (C) is incorrect because disregarding the $50,000 of selling and administrative costs in computing the contribution margin results in 102,858 units.
Answer (D) is incorrect because using a 60% tax rate rather than a 40% tax rate results in 145,000 units.
[Fact Pattern #104]
Donnelly Corporation manufactures and sells T-shirts imprinted with college names and slogans. Last year, the shirts sold for $7.50 each, and the variable cost to manufacture them was $2.25 per unit. The company needed to sell 20,000 shirts to break even. The net income last year was $5,040. Donnelly’s expectations for the coming year include the following:

- The sales price of the T-shirts will be $9
- Variable cost to manufacture will increase by one-third
- Fixed costs will increase by 10%
- The income tax rate of 40% will be unchanged

[1071](Refers to Fact Pattern #104)
Sales for the coming year are expected to exceed last year’s by 1,000 units. If this occurs, Donnelly’s sales volume in the coming year will be

A. 22,600 units.
B. 21,960 units.
C. 23,400 units.
D. 21,000 units.

- Answer (A) is correct. Because last year’s after-tax profit was $5,040, pretax net income must have been $8,400 ($5,040 ÷ (1.0 – .40)). Because fixed costs have been fully recovered at the BEP, all of the UCM beyond that sales level is included in pretax operating income. The UCM was $5.25, so the units sold in excess of the 20,000-unit BEP equaled 1,600 ($8,400 ÷ $5.25). If 21,600 total units were sold last year, an increase of 1,000 units results in sales of 22,600 units.

- Answer (B) is incorrect because Assuming that last year’s after-tax profit was the pretax operating income results in 21,960 units.

- Answer (C) is incorrect because Sales volume is estimated to be 22,600 units [20,000 + ($8,400 pretax NI ÷ $5.25 UCM) + 1,000].

- Answer (D) is incorrect because Sales volume is estimated to be 22,600 units [20,000 + ($8,400 pretax NI ÷ $5.25 UCM) + 1,000].

[1072](Refers to Fact Pattern #104)
If Donnelly Corporation wishes to earn $22,500 in net income for the coming year, the company’s sales volume in dollars must be

A. $213,750
B. $257,625
C. $207,000
D. $229,500

- Answer (A) is incorrect because The sales revenue when fixed costs are not increased by 10% is $213,750.

- Answer (B) is incorrect because Using a 60% tax rate rather than a 40% tax rate results in $257,625.

- Answer (C) is incorrect because Failing to convert the after-tax income of $22,500 to pretax income of $37,500 [$22,500 ÷ (1.0 – .40)] results in $207,000.

- Answer (D) is correct. An after-tax net income of $22,500 equals a pretax income of $37,500 ($22,500 ÷ (1.0 – .40)). With a UCM of $6 contributing toward the $153,000 total of fixed cost ($115,500) and desired profit ($37,500), 25,500 units ($153,000 ÷ $6) must be sold. At $9 per unit, sales revenue is $229,500.
Kim is thinking of organizing a fundraiser to support a local charity. She has planned to rent a banquet hall and provide the guests with food, entertainment, and various party favors. She has decided to charge $500 a person. After researching around town, Kim has discovered the following costs:

<table>
<thead>
<tr>
<th></th>
<th>Fixed Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rental fee of banquet hall</td>
<td>$150,000</td>
</tr>
<tr>
<td>Advertising</td>
<td>$50,000</td>
</tr>
<tr>
<td>Entertainment</td>
<td>$4,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable Costs</th>
<th>Per Guest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>$12</td>
</tr>
<tr>
<td>Other miscellaneous costs</td>
<td>8</td>
</tr>
</tbody>
</table>

If Kim’s goal is to raise $10,000 for her charity, how many people must attend the banquet?

A. 404  
B. 425  
C. 428  
D. 446

- **Answer (A) is incorrect because** This number of guests is found by subtracting the $10,000 of desired income from the fixed costs.
- **Answer (B) is incorrect because** This number of guests is the amount needed to break even.
- **Answer (C) is incorrect because** This number of guests is found by not subtracting the variable costs per person from the revenues per person to get the contribution margin.
- **Answer (D) is correct.** The number of guests Kim must have to raise $10,000 can be calculated as follows:

  \[
  \text{Target unit sales} = \frac{(\text{Fixed costs} + \text{Target operating income})}{\text{UCM}} \\
  = \frac{($150,000 + $50,000 + $4,000) + $10,000}{($500 – $12 – $8)} \\
  = \frac{$214,000}{480} \\
  = 445.83
  \]

Harper and her band want to put on a concert. They have looked at two venues, a small one and a large one, and have compiled the following information:

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity of venue</td>
<td>400</td>
<td>1,200</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$2,000</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

The variable cost per customer for both venues is $2. The band will charge $10 per customer for the small venue or $14 for the large venue.
Harper owes the local music store $1,000 for equipment. If she intends to use the profit from the concert to pay back the debt, how many tickets must she sell?

A. 300 small or 429 large.
B. 375 small or 429 large.
C. 375 small or 500 large.
D. 300 small or 500 large.

- Answer (A) is incorrect because not subtracting the variable cost from revenue in the small venue results in 300 ticket sales, and not subtracting the variable cost from revenues in the large venue results in 429 ticket sales.
- Answer (B) is incorrect because not subtracting the variable cost from revenues in the large venue results in 429 ticket sales.
- Answer (C) is correct. Harper’s unit contribution margins (UCM) for the small and large venues are $8 ($10 - $2) and $12 ($14 - $2), respectively. Treating profit as an additional fixed cost allows the calculation of target unit sales as follows:

  **Small**
  Target unit sales = (Fixed costs + Target operating income) ÷ UCM
  = ($2,000 + $1,000) ÷ $8
  = 375

  **Large**
  Target unit sales = (Fixed costs + Target operating income) ÷ UCM
  = ($5,000 + $1,000) ÷ $12
  = 500

- Answer (D) is incorrect because not subtracting the variable cost from revenue in the small venue results in 300 ticket sales.
[Fact Pattern #107]
The statement of income for Dimmell Co. presented below represents the operating results for the fiscal year just ended. Dimmell had sales of 1,800 tons of product during the current year. The manufacturing capacity of Dimmell’s facilities is 3,000 tons of product.

Dimmell Co.
Statement of Income
For the Year Ended December 31, Year 2

Sales $ 900,000
Variable costs:
  Manufacturing $315,000
  Selling costs 180,000 (495,000)
Contribution margin $ 405,000

Fixed costs:
  Manufacturing $  90,000
  Selling 112,500
  Administration 45,000 (247,500)
Operating income $ 157,500
  Income taxes (40%) (63,000)
Net income $   94,500

If the sales volume is estimated to be 2,100 tons in the next year, and if the prices and costs stay at the same levels and amounts next year, the net income that Dimmell can expect for Year 3 is

A. $135,000
B. $110,250
C. $283,500
D. $184,500

Answer (A) is correct. Because the selling price is $500 per ton, sales will be $1,050,000 (2,100 × $500). The contribution margin ratio is 45% ($405,000 ÷ $900,000), resulting in a contribution margin of $472,500 ($1,050,000 × .45). Operating income is the contribution margin minus fixed costs of $247,500, which equals $225,000. Net income is $135,000 [$225,000 × (1.0 – .40)].

Answer (B) is incorrect because Inversing the variable cost and contribution margin results in $110,250.
Answer (C) is incorrect because Failing to deduct non-manufacturing fixed costs results in $283,500.
Answer (D) is incorrect because Failing to deduct some fixed costs results in $184,500.

Dimmell has a potential foreign customer that has offered to buy 1,500 tons at $450 per ton. Assume that all of Dimmell’s costs would be at the same levels and rates as in Year 2. What net income would Dimmell make if it took this order and rejected some business from regular customers so as not to exceed capacity?

A. $297,500
B. $252,000
C. $211,500
D. $256,500
Answer (A) is incorrect because Failing to deduct selling expenses results in $297,500.

Answer (B) is incorrect because Ignoring administrative expenses results in $252,000.

Answer (C) is correct. Total sales equal $1,425,000 \[(1,500 \times $450) + (1,500 \times $500)\]. The unit variable cost of goods sold is $275 (55% of $500), and total variable cost of goods sold is $825,000 (3,000 units \times $275). The contribution margin is $600,000, which equals $1,425,000 of sales minus $825,000 cost of goods sold. Operating income is $352,500, which is the contribution margin of $600,000 minus $247,500 fixed costs. Net income of $211,500 is calculated by subtracting tax from operating income \[(352,500 \times (1.0 – .40))\].

Answer (D) is incorrect because This amount mixes variable costs and contribution margin.

[1077] Refers to Fact Pattern #107

Dimmell plans to market its product in a new territory. Dimmell estimates that an advertising and promotion program costing $61,500 annually would need to be undertaken for the next 2 or 3 years. In addition, a $25 per ton sales commission over and above the current commission to the sales force in the new territory would be required. How many tons would have to be sold in the new territory to maintain Dimmell’s current after-tax income of $94,500?

A. 307.5 tons
B. 1,095.0 tons
C. 273.333 tons
D. 1,545.0 tons

Answer (A) is correct. Given that $61,500 is required for advertising and promotion, these are fixed costs that will have to be covered by the CM for sales in the new market of $200 each. The UCM for regular sales was $225 ($500 selling price \times 45\%), and there is a $25 additional variable commission expense for sales in the new territory. The 45\% CM is computed by dividing the $405,000 CM by the $900,000 of sales. Thus, the new unit contribution of $200 is divided into $61,500 of incremental fixed costs, resulting in additional sales from the new program of 307.5 tons at the breakeven point.

Answer (B) is incorrect because This amount would result in a greater profit.

Answer (C) is incorrect because Ignoring the increased commissions in the new territory results in 273.333 tons.

Answer (D) is incorrect because This amount results in increased income.

[1078] Refers to Fact Pattern #107

Ignore the facts presented in any other question and now assume Dimmell estimates that the per ton selling price would decline 10\% next year. Variable costs would increase $40 per ton and the fixed costs would not change. What sales volume in dollars would be required to earn an after-tax income of $94,500 next year?

A. $1,140,000
B. $825,000
C. $1,500,000
D. $1,350,000

Answer (A) is incorrect because It results in an income of less than $94,500.

Answer (B) is incorrect because It results in an income of less than $94,500.

Answer (C) is incorrect because This amount results in an income above $94,500.

Answer (D) is correct. The selling price per unit will decrease from $500 to $450. The unit variable costs will increase from $275 to $315. Also, $157,500 of pretax profit is required to obtain $94,500 of after-tax profit \[(94,500 \div (1.0 – .40))\]. Thus, the number of units to be sold equals 3,000 \[(($247,500 FC + $157,500 pretax profit) \div ($450 – $315) UCM)\]. Multiplying 3,000 by the selling price of $450 results in $1,350,000 of sales.
A manufacturing concern sells its sole product for $10 per unit, with a unit contribution margin of $6. The fixed manufacturing cost rate per unit is $2 based on a denominator capacity of 1 million units, and fixed marketing costs are $1.5 million. If 900,000 units are produced, the absorption-costing breakeven point in units sold is

A. 425,000 units.
B. 583,333 units.
C. 900,000 units.
D. 1,000,000 units.

Answer (A) is correct. The absorption-costing breakeven point in units sold equals the sum of (1) the total fixed costs and (2) the product of the fixed manufacturing cost application rate and the difference between the BEP in units sold (X) and units produced, with the sum divided by the UCM. Thus, the absorption-costing breakeven point in units sold is 425,000 units:

\[ X = \frac{($2 \times 1,000,000 \text{ denominator capacity}) + $1,500,000 + $2(X - 900,000)}{$6} \]

\[ X = \frac{($3,500,000 + $2X - $1,800,000)}{$6} \]

\[ $6X = $1,700,000 + $2X \]

\[ X = 425,000 \]

Answer (B) is incorrect because this number of units is the variable-costing BEP.
Answer (C) is incorrect because this number of units is the actual production level.
Answer (D) is incorrect because this number of units is the capacity used to calculate the fixed overhead application rate.

For one of its divisions, Buona Fortuna Company has fixed costs of $300,000 and a variable-cost percentage equal to 60% of its $10 per unit selling price. It would like to earn a pre-tax income of $90,000 per year from the division.

How many units will Buona Fortuna have to sell to earn a pre-tax income of $90,000 per year?

A. 65,000 units.
B. 75,000 units.
C. 77,250 units.
D. 97,500 units.

Answer (A) is incorrect because using the unit variable cost in the denominator results in 65,000 units.
Answer (B) is incorrect because this number of units is the breakeven point.
Answer (C) is incorrect because this number of units would yield a profit less than the desired $90,000.
Answer (D) is **correct**. Buona Fortuna's unit contribution margin is $4 ($10 unit price – $6 unit variable cost). By treating desired profit as an additional fixed cost, the target unit sales can be calculated as follows:

\[
\text{Target unit sales} = \frac{\text{Fixed costs} + \text{Target operating income}}{\text{UCM}}
\]

\[
= \frac{($300,000 + $90,000)}{4}
\]

\[
= 97,500
\]

[1081] Based on potential sales of 1,000 units per year, a new product has estimated costs of $600,000. What is the target price to obtain a 20% return on sales?

A. $720  
B. $750  
C. $1,080  
D. $3,000

- Answer (A) is incorrect because this amount is based on a 20% return on costs.  
- Answer (B) is correct. If the company wants a 20% return on sales, the $600,000 of costs represent 80% of the selling price. Dividing $600,000 by .8 results in a total selling price of $750,000, or $750 per unit.  
- Answer (C) is incorrect because this amount is based on an 80% return on costs.  
- Answer (D) is incorrect because this amount is based on an 80% return on sales.

[1082] Stuffed Animals, Inc., has decided to focus strictly on producing and selling one type of teddy bear. For the upcoming year, Stuffed Animals hopes to make a 25% profit on sales. Fixed costs are set at $51,000, and variable costs are $9.50 per unit. If teddy bears are sold at $15 each, how many bears must be sold to meet the profit goal?

A. 5,514  
B. 9,273  
C. 13,600  
D. 29,143

- Answer (A) is incorrect because adding the profit margin to the contribution margin results in 5,514.  
- Answer (B) is incorrect because this number is the breakeven point.  
- Answer (C) is incorrect because using profit as the contribution margin results in 13,600.  
- Answer (D) is correct. Sales equal the sum of fixed costs, variable costs, and profit. The profit is the selling price per unit multiplied by the percentage profit desired. If \( x \) equals unit sales,

\[
15x = 51,000 + 9.50x + .25(15x)
\]

\[
15x = 51,000 + 13.25x
\]

\[
1.75x = 51,000
\]

\[
x = 29,143 \text{ units}
\]
Carson, Inc., manufactures only one product and is preparing its budget for next year based on the following information:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$100</td>
</tr>
<tr>
<td>Variable costs per unit</td>
<td>$75</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$250,000</td>
</tr>
<tr>
<td>Effective tax rate</td>
<td>35%</td>
</tr>
</tbody>
</table>

If Carson wants to achieve a net income of $1.3 million next year, its sales must be

A. 62,000 units.
B. 70,200 units.
C. 80,000 units.
D. 90,000 units.

- Answer (A) is incorrect because this figure results from failing to consider the effect of income taxes.
- Answer (B) is incorrect because this figure results from dividing the target net income by a unit contribution margin that has been divided by (1 + tax rate).
- Answer (C) is incorrect because this figure results from failing to include fixed costs.
- Answer (D) is correct. Carson’s unit contribution margin is $25 ($100 selling price – $75 unit variable cost).

Treating desired after-tax profit as an additional fixed cost allows the target unit sales to be calculated as follows:

\[
\text{Target unit sales} = \frac{\text{Fixed costs} + \left(\frac{\text{Target net income}}{1.0 - 0.35}\right)}{\text{UCM}}
\]

\[
= \frac{[$250,000 + ($1,300,000 ÷ 0.65)]}{25}
\]

\[
= (90,000)
\]

Robin Company wants to earn a 6% return on sales after taxes. The company’s effective income tax rate is 40%, and its contribution margin is 30%. If Robin has fixed costs of $240,000, the amount of sales required to earn the desired return is

A. $375,000
B. $400,000
C. $1,000,000
D. $1,200,000

- Answer (A) is incorrect because the amount of $375,000 results from using the variable cost ratio instead of the contribution margin ratio and ignoring the effects of income taxes.
- Answer (B) is incorrect because the amount of $400,000 results from using the variable cost ratio instead of the contribution margin ratio.
- Answer (C) is incorrect because the amount of $1,000,000 results from ignoring the effects of income taxes.
Answer (D) is correct. Robin can calculate its target sales figure as follows:

\[
\text{Net income} = \text{Operating income} - (\text{Operating income} \times \text{Tax rate})
\]

\[
.06\text{Sales} = .3\text{Sales} - \$240,000 - [(.3\text{Sales} - \$240,000) \times .40]
\]

\[
.06\text{Sales} = .3\text{Sales} - \$240,000 - .12\text{Sales} + \$96,000
\]

\[
-.12\text{Sales} = -\$144,000
\]

\[
\text{Sales} = \$1,200,000
\]

Bargain Press is considering publishing a new textbook. The publisher has developed the following cost data related to a production run of 6,000, the minimum possible production run. Bargain Press will sell the textbook for $45 per copy. How many textbooks must Bargain Press sell in order to generate operating earnings (earnings before interest and taxes) of 20% on sales? (Round your answer up to the nearest whole textbook.)

<table>
<thead>
<tr>
<th>Estimated cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development (reviews, class testing, editing)</td>
</tr>
<tr>
<td>Typesetting</td>
</tr>
<tr>
<td>Depreciation on equipment</td>
</tr>
<tr>
<td>General and administrative</td>
</tr>
<tr>
<td>Miscellaneous fixed costs</td>
</tr>
<tr>
<td>Printing and binding</td>
</tr>
<tr>
<td>Sales staff commissions (2% of selling price)</td>
</tr>
<tr>
<td>Bookstore commissions (25% of selling price)</td>
</tr>
<tr>
<td>Author’s royalties (10% of selling price)</td>
</tr>
<tr>
<td><strong>Total costs at production of 6,000 copies</strong></td>
</tr>
</tbody>
</table>

A. 2,076 copies.
B. 5,207 copies.
C. 5,412 copies.
D. 6,199 copies.

Answer (A) is incorrect because the amount of 2,076 copies results from ignoring variable costs.
Answer (B) is correct. Bargain can classify its production costs for this book as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development</td>
<td>$35,000</td>
</tr>
<tr>
<td>Typesetting</td>
<td>18,500</td>
</tr>
<tr>
<td>Depreciation</td>
<td>9,320</td>
</tr>
<tr>
<td>General and admin.</td>
<td>7,500</td>
</tr>
<tr>
<td>Miscellaneous fixed costs</td>
<td>4,400</td>
</tr>
<tr>
<td>Printing and binding</td>
<td>$30,000</td>
</tr>
<tr>
<td>Sales staff commissions</td>
<td>5,400</td>
</tr>
<tr>
<td>Bookstore commissions</td>
<td>67,500</td>
</tr>
<tr>
<td>Author’s royalties</td>
<td>27,000</td>
</tr>
<tr>
<td>Total production costs</td>
<td>$129,900</td>
</tr>
</tbody>
</table>

Per-unit variable costs are $21.65 ($129,900 ÷ 6,000 copies). Target operating income is $9 per book ($45 × 20%). Bargain can now calculate the number of textbooks that must be sold to meet this target figure:

\[
\text{Sales} - \text{Variable costs} - \text{Fixed costs} = \text{Operating income}
\]

\[
\frac{\text{Sales} - 0.3\times \text{Sales} - \$600,000 = \$24,000}{\text{Sales} = \$914,286}
\]

Answer (C) is incorrect because The amount of 5,412 copies results from treating printing and binding as a fixed cost.

Answer (D) is incorrect because The amount of 6,199 copies is a meaningless answer since it is greater than the production run (i.e., outside the relevant range).

Zipper Company invested $300,000 in a new machine to produce cones for the textile industry. Zipper’s variable costs are 30% of the selling price, and its fixed costs are $600,000. Zipper has an effective income tax rate of 40%. The amount of sales required to earn an 8% after-tax return on its investment would be

A. $891,429
B. $914,286
C. $2,080,000
D. $2,133,333

Answer (A) is incorrect because The amount of $891,429 results from setting operating income, rather than net income, to the target return on investment.

Answer (B) is correct. Zipper can calculate its target sales figure as follows:

\[
\text{Contribution margin} - \text{Fixed costs} = \text{Operating income}
\]

\[
\text{Sales} - 0.3\times \text{Sales} - \$600,000 = \frac{0.08(\$300,000) \times (1.0 - .40)}{0.7\times \text{Sales} - \$600,000 = \$24,000 \times (1.0 - .40)}
\]

\[
\text{Sales} - 0.7\times \text{Sales} = \$640,000
\]

\[
\text{Sales} = \$914,286
\]

Answer (C) is incorrect because The amount of $2,080,000 results from setting operating income, rather than net income, to the target return on investment and reversing the variable cost ratio.
Answer (D) is incorrect because the amount of $2,133,333 results from reversing the variable cost ratio.

[Fact Pattern #109]
Starlight Theater stages a number of summer musicals at its theater in northern Ohio. Preliminary planning has just begun for the upcoming season, and Starlight has developed the following estimated data:

<table>
<thead>
<tr>
<th>Production</th>
<th>Number of Performances</th>
<th>Average Attendance per Performance</th>
<th>Ticket Price</th>
<th>Variable Costs¹</th>
<th>Fixed Costs²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Wonderful</td>
<td>12</td>
<td>3,500</td>
<td>$18</td>
<td>$3</td>
<td>$165,000</td>
</tr>
<tr>
<td>That’s Life</td>
<td>20</td>
<td>3,000</td>
<td>15</td>
<td>1</td>
<td>249,000</td>
</tr>
<tr>
<td>All That Jazz</td>
<td>12</td>
<td>4,000</td>
<td>20</td>
<td>0</td>
<td>316,000</td>
</tr>
</tbody>
</table>

¹ Represent payments to production companies and are based on tickets sold.
² Costs directly associated with the entire run of each production for costumes, sets, and artist fees.

Starlight will also incur $565,000 of common fixed operating charges (administrative overhead, facility costs, and advertising) for the entire season and is subject to a 30% income tax rate.

[1087] Refers to Fact Pattern #109
If Starlight’s management desires “Mr. Wonderful” to produce an after-tax contribution of $210,000 toward the firm’s overall operating income for the year, total attendance for the production would have to be

A. 20,800
B. 25,000
C. 25,833
D. 31,000

- Answer (A) is incorrect because the figure 20,800 results from failing to include fixed costs.
- Answer (B) is incorrect because the figure 25,000 results from failing to consider the effect of income taxes.
- Answer (C) is incorrect because the figure 25,833 results from failing to subtract variable costs.
- Answer (D) is correct. The unit contribution margin on “Mr. Wonderful” is $15 ($18 selling price – $3 unit variable cost). Treating desired after-tax profit as an additional fixed cost allows the target unit sales to be calculated as follows:

\[
\text{Target unit sales} = \frac{\text{Fixed costs} + \left(\text{Target net income} \div (1.0 - .30)\right)}{\text{UCM}}
\]
\[
= \frac{\$165,000 + \left(\$210,000 \div .70\right)}{15}
\]
\[
= \frac{\$165,000 + \$300,000}{15}
\]
\[
= 31,000
\]
A company attempts to achieve an annual after-tax operating profit of $2,400,000 by selling a good for $3,000 per unit. Production of the good involves fixed costs of $15,000,000 and variable cost per unit of $2,000. Assuming an average income tax rate of 40%, the volume (in units) required to produce the target amount of profit would be

A. 15,000
B. 16,440
C. 19,000
D. 21,000

- Answer (A) is incorrect because the amount of 15,000 incorrectly excludes the target operating income from the numerator.
- Answer (B) is incorrect because the amount of 16,440 is given as a distractor and has no logical calculation base.
- Answer (C) is correct. The formula for target unit volume is as follows:

\[
\frac{\text{Fixed costs + Target operating income}}{\text{Unit contribution margin}}
\]

In this question, the unit contribution margin is $1,000 ($3,000 – $2,000). The fixed costs of $15,000,000 are given. Target operating income has to be on a pretax basis. In this question, an after-tax figure is given and must be adjusted accordingly:

\[
\$2,400,000 = X (100\% - 40\%)
\]
\[
X = \$2,400,000 \div 60\%
\]
\[
X = \$4,000,000
\]

Now plug the numbers into the formula and solve for target unit volume:

Target unit volume = \(\frac{\$15,000,000 + \$4,000,000}{\$1,000}\)

Target unit volume = 19,000 units

- Answer (D) is incorrect because the amount of 21,000 is given as a distractor and has no logical calculation base.

[Fact Pattern #110]

Moorehead Manufacturing Company produces two products for which the data presented to the right have been tabulated. Fixed manufacturing cost is applied at a rate of $1.00 per machine hour. The sales manager has had a $160,000 increase in the budget allotment for advertising and wants to apply the money to the most profitable product. The products are not substitutes for one another in the eyes of the company’s customers.
Suppose Moorehead has only 100,000 machine hours that can be made available to produce additional units of XY-7 and BD-4. If the potential increase in sales units for either product resulting from advertising is far in excess of this production capacity, which product should be advertised and what is the estimated increase in contribution margin earned?

A. Product XY-7 should be produced, yielding a contribution margin of $75,000.
B. Product XY-7 should be produced, yielding a contribution margin of $133,333.
C. Product BD-4 should be produced, yielding a contribution margin of $187,500.
D. Product BD-4 should be produced, yielding a contribution margin of $250,000.

- Answer (A) is incorrect because Product XY-7 actually has a CM of $133,333, which is lower than the $250,000 CM for product BD-4.
- Answer (B) is incorrect because Product BD-4 has a higher CM at $250,000.
- Answer (C) is incorrect because Product BD-4 has a CM of $250,000.
- Answer (D) is correct. The machine hours are a scarce resource that must be allocated to the product(s) in a proportion that maximizes the total CM. Given that potential additional sales of either product are in excess of production capacity, only the product with the greater CM per unit of scarce resource should be produced. XY-7 requires .75 hours; BD-4 requires .2 hours of machine time (given fixed manufacturing cost applied at $1 per machine hour of $.75 for XY-7 and $.20 for BD-4).

XY-7 has a CM of $1.33 per machine hour ($1 UCM ÷ .75 hours), and BD-4 has a CM of $2.50 per machine hour ($.50 ÷ .2 hours). Thus, only BD-4 should be produced, yielding a CM of $250,000 (100,000 × $2.50). The key to the analysis is CM per unit of scarce resource.

---

**Fact Pattern #111**

MultiFrame Company has the following revenue and cost budgets for the two products it sells:

<table>
<thead>
<tr>
<th></th>
<th>Plastic Frames</th>
<th>Glass Frames</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price</td>
<td>$10.00</td>
<td>$15.00</td>
</tr>
<tr>
<td>Direct materials</td>
<td>(2.00)</td>
<td>(3.00)</td>
</tr>
<tr>
<td>Direct labor</td>
<td>(3.00)</td>
<td>(5.00)</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>(3.00)</td>
<td>(4.00)</td>
</tr>
<tr>
<td>Net income per unit</td>
<td>$ 2.00</td>
<td>$ 3.00</td>
</tr>
<tr>
<td>Budgeted unit sales</td>
<td>100,000</td>
<td>300,000</td>
</tr>
</tbody>
</table>

The budgeted unit sales equal the current unit demand, and total fixed overhead for the year is budgeted at $975,000. Assume that the company plans to maintain the same proportional mix. In numerical calculations, MultiFrame rounds to the nearest cent and unit.

---

**Fact Pattern #111**

The total number of units MultiFrame needs to produce and sell to break even is

A. 150,000 units.
B. 354,545 units.
C. 177,273 units.
D. 300,000 units.
Answer (A) is correct. The calculation of the breakeven point is to divide the fixed costs by the contribution margin per unit. This determination is more complicated for a multi-product firm. If the same proportional product mix is maintained, one unit of plastic frames is sold for every three units of glass frames. Accordingly, a composite unit consists of four frames: one plastic and three glass. For plastic frames, the unit contribution margin is $5 ($10 – $2 – $3). For glass frames, the unit contribution margin is $7 ($15 – $3 – $5). Thus, the composite unit contribution margin is $26 ($5 + $7 + $7 + $7), and the breakeven point is 37,500 packages ($975,000 FC ÷ $26). Because each composite unit contains four frames, the total units sold equal 150,000.

Answer (B) is incorrect because the total units sold at the breakeven point is 150,000.

Answer (C) is incorrect because the total units sold at the breakeven point is 150,000.

Answer (D) is incorrect because the total units sold at the breakeven point is 150,000.

[1091] Refers to Fact Pattern #111

The total number of units needed to break even if the budgeted direct labor costs were $2 for plastic frames instead of $3 is

A. 154,028 units.
B. 144,444 units.
C. 156,000 units.
D. 146,177 units.

Answer (A) is incorrect because the new breakeven point is 144,444 units.

Answer (B) is correct. If the labor costs for the plastic frames are reduced by $1, the composite unit contribution margin will be $27 ($(10 – 2 – 2) + [(15 – 3 – 5) × 3])$. Hence, the new breakeven point is 144,444 units [4 units × ($975,000 FC ÷ $27)].

Answer (C) is incorrect because the new breakeven point is 144,444 units.

Answer (D) is incorrect because the new breakeven point is 144,444 units.

[1092] Refers to Fact Pattern #111

The total number of units needed to break even if sales were budgeted at 150,000 units of plastic frames and 300,000 units of glass frames with all other costs remaining constant is

A. 171,958 units.
B. 418,455 units.
C. 153,947 units.
D. 365,168 units.

Answer (A) is incorrect because the breakeven point in units will be 153,947.

Answer (B) is incorrect because the breakeven point in units will be 153,947.

Answer (C) is correct. The unit contribution margins for plastic frames and glass frames are $5 ($10 – $2 – $3) and $7 ($15 – $3 – $5), respectively. If the number of plastic frames sold is 50% of the number of glass frames sold, a composite unit will contain one plastic frame and two glass frames. Thus, the composite unit contribution margin will be $19 ($5 + $7 + $7), and the breakeven point in units will be 153,947 [3 units × ($975,000 ÷ $19)].

Answer (D) is incorrect because the breakeven point in units will be 153,947.
Siberian Ski Company recently expanded its manufacturing capacity to allow it to produce up to 15,000 pairs of cross-country skis of the mountaineering model or the touring model. The sales department assures management that it can sell between 9,000 pairs and 13,000 pairs (units) of either product this year. Because the models are very similar, Siberian Ski will produce only one of the two models. The information below was compiled by the accounting department.

<table>
<thead>
<tr>
<th>Model</th>
<th>Mountaineering</th>
<th>Touring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$88.00</td>
<td>$80.00</td>
</tr>
<tr>
<td>Variable costs per unit</td>
<td>52.80</td>
<td>52.80</td>
</tr>
</tbody>
</table>

Fixed costs will total $369,600 if the mountaineering model is produced but will be only $316,800 if the touring model is produced. Siberian Ski is subject to a 40% income tax rate.

[Refers to Fact Pattern #112]

The total sales revenue at which Siberian Ski Company would make the same profit or loss regardless of the ski model it decided to produce is

A. $880,000
B. $422,400
C. $924,000
D. $686,400

Answer (A) is correct. The sales revenue at which the same profit or loss will be made equals the unit price times the units sold for each kind of skis. Accordingly, if M is the number of units sold of mountaineering skis and T is the number of units sold of touring skis, this level of sales revenue may be stated as $88M or $80T, and M is therefore equal to ($80 ÷ $88)T. Moreover, given the same profit or loss, the difference between sales revenue and total costs (variable + fixed) will also be the same for the two kinds of skis. Solving the equation below by substituting for M yields sales revenue of $880,000 [(11,000 × $80) or (10,000 × $88)].

\[
\begin{align*}
\text{Sales}_M - VC_M - FC_M &= \text{Sales}_T - VC_T - FC_T \\
$88M - $52.80M - $369,600 &= $80T - $52.80T - $316,800 \\
$35.2M - $52,800 &= $27.2T \\
$35.2($80 ÷ $88)T &= $27.2T + $52,800 \\
T &= 11,000 \text{ units} \\
M &= 10,000 \text{ units}
\end{align*}
\]

Answer (B) is incorrect because The same profit or loss is earned at a sales revenue of $880,000.
Answer (C) is incorrect because The same profit or loss is earned at a sales revenue of $880,000.
Answer (D) is incorrect because The same profit or loss is earned at a sales revenue of $880,000.
If the Siberian Ski Company Sales Department could guarantee the annual sale of 12,000 pairs of either model, Siberian Ski would

A. Produce 12,000 pairs of touring skis because they have a lower fixed cost.
B. Be indifferent as to which model is sold because each model has the same variable cost per unit.
C. Produce 12,000 pairs of mountaineering skis because they have a lower breakeven point.
D. Produce 12,000 pairs of mountaineering skis because they are more profitable.

- Answer (A) is incorrect because at a sales volume of 12,000 pairs, the higher contribution margin of the mountaineering skis results in a greater profit.
- Answer (B) is incorrect because the lower selling price of the touring skis results in a lower contribution margin per unit sold.
- Answer (C) is incorrect because breakeven point is not a consideration. A sales volume of 12,000 units is above the breakeven point for both models.
- Answer (D) is correct. Preparing income statements determines which model will produce the greater profit at a sales level of 12,000 pairs. Thus, as indicated below, the mountaineering skis should be produced.

<table>
<thead>
<tr>
<th></th>
<th>Mountain</th>
<th>Touring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$1,056,000</td>
<td>$960,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>(633,600)</td>
<td>(633,600)</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>(369,600)</td>
<td>(316,800)</td>
</tr>
<tr>
<td>Operating Income</td>
<td>$ 52,800</td>
<td>$ 9,600</td>
</tr>
</tbody>
</table>

If Siberian Ski Company desires an after-tax net income of $24,000, how many pairs of touring model skis will the company have to sell?

A. 13,118 pairs.
B. 12,529 pairs.
C. 13,853 pairs.
D. 4,460 pairs.

- Answer (A) is correct. The breakeven sales volume equals total fixed costs divided by the unit contribution margin (UCM). In the breakeven formula, the desired profit should be treated as a fixed cost. Because the UCM is stated in pretax dollars, the targeted profit must be adjusted for taxes. Hence, the targeted after-tax net income of $24,000 is equivalent to a pretax profit of $40,000 ($24,000 ÷ (1.0 – .40)). The sum of the pretax profit and the fixed costs is $356,800 ($316,800 + $40,000). Consequently, the desired sales volume is 13,118 pairs of touring skis [$356,800 ÷ ($80 selling price – $52.80 unit variable cost)].
- Answer (B) is incorrect because the number of touring skis that must be sold is 13,118 pairs.
- Answer (C) is incorrect because the number of touring skis that must be sold is 13,118 pairs.
- Answer (D) is incorrect because the number of touring skis that must be sold is 13,118 pairs.
Mason Enterprises has prepared the following budget for the month of July:

<table>
<thead>
<tr>
<th></th>
<th>Selling Price Per Unit</th>
<th>Variable Cost Per Unit</th>
<th>Unit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>$10.00</td>
<td>$4.00</td>
<td>15,000</td>
</tr>
<tr>
<td>Product B</td>
<td>15.00</td>
<td>8.00</td>
<td>20,000</td>
</tr>
<tr>
<td>Product C</td>
<td>18.00</td>
<td>9.00</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Assuming that total fixed costs will be $150,000 and the mix remains constant, the breakeven point (rounded to the next higher whole unit) will be

A. 20,455 units.
B. 21,429 units.
C. 21,819 units.
D. 6,818 units.

- Answer (A) is incorrect because the breakeven point is 21,819 units.
- Answer (B) is incorrect because the breakeven point is 21,819 units.
- Answer (C) is correct. Given the constant product mix of 3:4:1 established by the budgeted unit sales, a composite unit consists of eight individual units (3 of A, 4 of B, and 1 of C). The unit contribution margins for A, B, and C are $6 ($10 selling price – $4 unit variable cost), $7 ($15 selling price – $8 unit variable cost), and $9 ($18 selling price – $9 unit variable cost), respectively. Hence, the contribution margin for a composite unit is $55 [(3 × $6) + (4 × $7) + (1 × $9)], and the breakeven point is 2,727.2727 composite units ($150,000 FC ÷ $55). This amount equals 21,819 (rounded up) individual units (8 × 2,727.2727).
- Answer (D) is incorrect because this number of units is based on an average contribution margin of $22 per unit.

[Fact Pattern #113]
The data below are available for Xerbert Co.:

<table>
<thead>
<tr>
<th></th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Xenox</td>
<td>Xeon</td>
</tr>
<tr>
<td>Unit sales</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>Net dollar sales</td>
<td>$900</td>
<td>$1,000</td>
</tr>
<tr>
<td>Variable expenses</td>
<td>(450)</td>
<td>(750)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$450</td>
<td>$250</td>
</tr>
<tr>
<td>Fixed expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td>$153</td>
</tr>
<tr>
<td>Marketing</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>Other fixed expenses</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Total fixed expenses</td>
<td></td>
<td>$448</td>
</tr>
<tr>
<td>Income before taxes</td>
<td></td>
<td>$252</td>
</tr>
</tbody>
</table>
The percentage difference between the actual and the budgeted breakeven point in units was that actual was

A. 5.00% above budget.
B. 6.67% below budget.
C. 6.67% above budget.
D. 5.00% below budget.

- Answer (A) is correct. According to the budget, sales of 250 units would produce a contribution margin of $700, or $2.80 per unit. Dividing the $448 of budgeted fixed costs by $2.80 gives a breakeven point of 160 units. The 260 actual units sold produced a contribution margin of $650, or $2.50 per unit. Dividing the $420 of fixed costs by $2.50 gives a breakeven point of 168 units. Consequently, the actual breakeven point is 5% (8 ÷ 160) above the budget.
- Answer (B) is incorrect because the percentage difference between the actual and the budgeted fixed costs is 6.67% \([420 – 448) ÷ 448\].
- Answer (C) is incorrect because the percentage difference between the actual and the budgeted fixed costs is 6.67% \([420 – 448) ÷ 448\].
- Answer (D) is incorrect because the percentage difference between the actual and the budgeted breakeven point was 5.00% above (not below) the budget.

The budgeted total volume of 250,000 units was based upon Xerbert’s achieving a market share of 10%. Actual industry volume was 2,580,000 units. Xerbert’s increased volume owing to improved market share is

A. 100%
B. 80%
C. 20%
D. 4%

- Answer (A) is incorrect because only 20% of the increased volume is due to an improved market share, while the other 80% is due to the increased industry volume.
- Answer (B) is incorrect because this percentage of the increased volume was due to the increased industry volume.
- Answer (C) is correct. Based on the revised industry volume, Xerbert should have sold 258,000 units \((2,580,000 \times 10\%\) ). Because 260,000 were actually sold, the company increased its market share by 2,000, or 20% of the 10,000 \((260,000 – 250,000)\) increase.
- Answer (D) is incorrect because the percentage increase in actual unit sales over budgeted unit sales is 4% \([(260 units – 250 units) ÷ 250 units]\).

The variance of actual contribution margin from budgeted contribution margin attributable to sales price is

A. $115,000 unfavorable.
B. $115,000 favorable.
C. $65,000 favorable.
D. $65,000 unfavorable.
Answer (A) is incorrect because the total variance between actual and budgeted sales is $115,000 (favorable). The sales price variance is $65,000 (unfavorable), and the sales quantity variance is $180,000 (favorable), for a total favorable variance of $115,000. The sales price variance is unfavorable because actual sales were less than budgeted sales, and the sales quantity variance is favorable because actual quantity exceeded budgeted quantity.

Answer (B) is incorrect because the total variance between actual and budgeted sales is $115,000 (favorable). The sales price variance is $65,000 (unfavorable), and the sales quantity variance is $180,000 (favorable), for a total favorable variance of $115,000. The sales price variance is unfavorable because actual sales were less than budgeted sales, and the sales quantity variance is favorable because actual quantity exceeded budgeted quantity.

Answer (C) is incorrect because the actual sales price for Xeon was less than the budgeted sales price, creating a $65,000 unfavorable sales price variance.

Answer (D) is correct. The budgeted prices of Xenox and Xeon were $6 and $10 per unit, respectively. Actual sales in units multiplied by the budgeted prices equals total sales of $2,080,000. Because actual sales were only $2,015,000, the variance of $65,000 is unfavorable (lower sales than budgeted).

[1100] Refers to Fact Pattern #113

The variance of actual contribution margin from budgeted contribution attributable to unit variable cost changes is

A. $165,000 favorable.
B. $137,000 favorable.
C. $137,000 unfavorable.
D. Zero, because actual unit variable costs were the same as budgeted unit variable costs.

Answer (A) is incorrect because the variable quantity (not unit cost) variance is $165,000 (unfavorable). The variable quantity variance is unfavorable because actual expenses are greater than budgeted expenses.

Answer (B) is incorrect because the total variance for variable and fixed expenses is $137,000. It is unfavorable because actual expenses are greater than budgeted expenses.

Answer (C) is incorrect because the total variance for variable and fixed expenses is $137,000. It is unfavorable because actual expenses are greater than budgeted expenses.

Answer (D) is correct. The proper procedure is to calculate variable costs by multiplying actual units sold by the budgeted costs per unit. The budgeted costs of Xenox and Xeon were $3 and $7.50, respectively. The actual costs ($390 and $975) were identical to budgeted variable costs at the actual volume. Thus, the variance was zero.

[1101] Specialty Cakes, Inc., produces two types of cakes, a round cake and a heart-shaped cake. Total fixed costs for the firm are $92,000. Variable costs and sales data for these cakes are presented below.

<table>
<thead>
<tr>
<th></th>
<th>Round Cake</th>
<th>Heart-shaped Cake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$12</td>
<td>$20</td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Budgeted sales (units)</td>
<td>10,000</td>
<td>15,000</td>
</tr>
</tbody>
</table>

How many cakes will be required to reach the breakeven point?

A. 8,000 round cakes and 12,000 heart-shaped cakes.
B. 9,000 round cakes and 11,000 heart-shaped cakes.
C. 10,000 round cakes and 10,000 heart-shaped cakes.
D. 23,000 round cakes and 18,400 heart-shaped cakes.
Answer (A) is correct. In a multiproduct setting, the contribution margin of each product must be weighted according to its proportion of total sales. Specialty’s breakeven quantities can therefore be derived thusly:

Weighted UCM = \[ \frac{($12 - $8) \times [10,000 \div (10,000 + 15,000)]}{10,000} + \frac{($20 - $15) \times [15,000 \div (10,000 + 15,000)]}{15,000} \]
\[ = ($4 \times 40\%) + ($5 \times 60\%) \]
\[ = $1.60 + $3.00 \]
\[ = $4.60 \text{ per composite unit} \]

Breakeven point = Fixed costs ÷ UCM
\[ = \frac{$92,000}{$4.60} \]
\[ = 20,000 \text{ composite units} \]

The breakeven point in round cakes is therefore 8,000 units (20,000 composite × 40%), and the breakeven point in heart-shaped cakes is 12,000 units (20,000 composite × 60%).

Answer (B) is incorrect because an allocation of 9,000 round cakes and 11,000 heart-shaped cakes results from an improper weighting of 55:45.

Answer (C) is incorrect because an allocation of 10,000 round cakes and 10,000 heart-shaped cakes results from an improper weighting of 50:50.

Answer (D) is incorrect because an allocation of 23,000 round cakes and 18,400 heart-shaped cakes results from assuming $184,000 of fixed costs ($92,000 for each product) and calculating the breakeven point for each cake separately.

[1102]A company with $280,000 of fixed costs has the following data:

<table>
<thead>
<tr>
<th></th>
<th>Product A</th>
<th>Product B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price per unit</td>
<td>$5</td>
<td>$6</td>
</tr>
<tr>
<td>Variable costs per unit</td>
<td>$3</td>
<td>$5</td>
</tr>
</tbody>
</table>

Assume three units of A are sold for each unit of B sold. How much will sales be in dollars of product B at the breakeven point?

A. $200,000
B. $240,000
C. $280,000
D. $840,000

Answer (A) is incorrect because applying product A’s price results in $200,000 (40,000 × $5).

Answer (B) is correct. The breakeven point equals fixed costs divided by unit contribution margin. The composite unit contribution margin for A and B is $7 \[ (3 \text{ units of A} \times ($5 - $3)) + (1 \text{ unit of B} \times ($6 - $5)) \]. Thus, 40,000 composite units ($280,000 ÷ $7), including 40,000 units of B, are sold at the breakeven point. Hence, sales of B at the breakeven point equal $240,000 (40,000 units × $6).

Answer (C) is incorrect because fixed costs equal $280,000.

Answer (D) is incorrect because product A sales and product B sales at the breakeven point equals $840,000.
Two companies are expected to have annual sales of 1,000,000 decks of playing cards next year. Estimates for next year are presented below:

<table>
<thead>
<tr>
<th></th>
<th>Company 1</th>
<th>Company 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per deck</td>
<td>$3.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>Cost of paper per deck</td>
<td>.62</td>
<td>.65</td>
</tr>
<tr>
<td>Printing ink per deck</td>
<td>.13</td>
<td>.15</td>
</tr>
<tr>
<td>Labor per deck</td>
<td>.75</td>
<td>1.25</td>
</tr>
<tr>
<td>Variable overhead per deck</td>
<td>.30</td>
<td>.35</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$960,000</td>
<td>$252,000</td>
</tr>
</tbody>
</table>

Given these data, which of the following responses is true?

- **Answer (A) is correct.** Company 1’s unit contribution margin is $1.20 ($3 – $.62 – .13 – .75 – .30) and Company 2’s is $.60 ($3 – .65 – .15 – 1.25 – .35). The BEP in units is found by dividing the fixed costs by the UCM. Thus, Company 1’s is 800,000 ($960,000 ÷ $1.20) and Company 2’s is 420,000 ($252,000 ÷ $.60).

The volume at which profits are equal occurs when the difference between total revenue and total cost is also the same. Company 1 has a per unit cost of $1.80 ($.62 + .13 + .75 + .30) and Company 2 has a per unit cost of $2.40 ($.65 + .15 + 1.25 + .35). Both charge $3 per deck, so total revenue for the two companies at the indifference volume (U) will be equal. Consequently, total costs should also be equal.

\[
U(.62 + .13 + .75 + .30) + 960,000 = U(.65 + .15 + 1.25 + .35) + 252,000
\]

\[
1.80U + 960,000 = 2.40U + 252,000
\]

\[
.60U = 708,000
\]

\[
U = 1,180,000
\]

- **Answer (B) is incorrect because** the volume at which Company 1 and Company 2 have equal profits is 1,180,000 units.

- **Answer (C) is incorrect because** the breakeven point is determined by dividing fixed costs by unit contribution margin, not unit variable costs. Furthermore, the volume at which there are equal profits between the companies is also higher.

- **Answer (D) is incorrect because** the breakeven point is determined by dividing fixed costs by unit contribution margin, not unit variable costs.

---

**Fact Pattern #114**

A company sells two products, X and Y. The sales mix consists of a composite unit of 2 units of X for every 5 units of Y (2:5). Fixed costs are $49,500. The unit contribution margins for X and Y are $2.50 and $1.20, respectively.
Considering the company as a whole, the number of composite units to break even is

A. 1,650 composite units.
B. 4,500 composite units.
C. 8,250 composite units.
D. 22,500 composite units.

- Answer (A) is incorrect because the contribution margin for the ratio of each product should be added, not multiplied, in determining the composite contribution margin.
- Answer (B) is correct. The composite break-even point for a multiproduct firm is computed by dividing total fixed costs by a composite contribution margin.

\[
\text{Composite contribution margin} = 2(\$2.50) + 5(\$1.20) = \$11 \\
\text{BEP} = \frac{\$49,500}{\$11} = 4,500 \text{ composite units}
\]

- Answer (C) is incorrect because the result if the composite unit consisted only of five units of Y would be 8,250 units ($49,500 \div (5 \times \$1.20)$).
- Answer (D) is incorrect because the number of units of Y in 4,500 composite units is 22,500.

If the company had a profit of $22,000, the unit sales must have been

<table>
<thead>
<tr>
<th>Product X</th>
<th>Product Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 5,000</td>
<td>12,500</td>
</tr>
<tr>
<td>B. 13,000</td>
<td>32,500</td>
</tr>
<tr>
<td>C. 23,800</td>
<td>59,500</td>
</tr>
<tr>
<td>D. 32,500</td>
<td>13,000</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because a $44,000 loss would result with 5,000 units of X and 12,500 units of Y. The $22,000 of profit should be added to (not subtracted from) fixed costs in determining the number of units sold.
- Answer (B) is correct. Unit sales can be computed by adding profit to fixed costs and dividing by the composite contribution margin.

\[
\text{Target unit sales} = \frac{\text{Fixed costs} + \text{Operating profit}}{\text{Composite UCM}} \\
= \frac{\$49,500 + \$22,000}{\$11} \\
= 6,500
\]

Thus, 13,000 units of Product X and 32,500 units of Product Y must have been sold.
- Answer (C) is incorrect because a $59,400 profit would be the result of 23,800 units of X and 59,500 units of Y. The composite contribution margin from two units of X and five units of Y must be used to determine the number of units sold.
- Answer (D) is incorrect because unit sales of Y equals 32,500, and unit sales of X equals 13,000.
Product A accounts for 75% of a company’s total sales revenue and has a variable cost equal to 60% of its selling price. Product B accounts for 25% of total sales revenue and has a variable cost equal to 85% of its selling price. What is the breakeven point given fixed costs of $150,000?

A. $375,000
B. $444,444
C. $500,000
D. $545,455

- Answer (A) is incorrect because this amount is based on the contribution margin of Product A only rather than a weighted average.
- Answer (B) is correct. Using the relationship: sales = total variable costs + total fixed costs, the combined breakeven point can be calculated as follows:

\[
S = 0.75S(0.60) + 0.25S(0.85) + $150,000
\]

\[
S = 0.45S + 0.2125S + $150,000
\]

\[
S - 0.6625S = $150,000
\]

\[
0.3375S = $150,000
\]

\[
S = $444,444
\]

- Answer (C) is incorrect because this amount is based on half of the required sales at B’s contribution margin.
- Answer (D) is incorrect because this amount is based on an unweighted average of the two contribution margins.

Von Stuttgatt International’s breakeven point is 8,000 racing bicycles and 12,000 5-speed bicycles. If the selling price and variable costs are $570 and $200 for a racer, and $180 and $90 for a 5-speed respectively, what is the weighted-average contribution margin?

A. $100
B. $145
C. $179
D. $202

- Answer (A) is incorrect because the sales mix dictates how much of the total CM will come from sales of each product. Unit sales are attributable 40% to racers and 60% to 5-speeds, so 40% of the UCM for racers must be added to 60% of the UCM for 5-speeds to get the weighted-average CM.
- Answer (B) is incorrect because the sales mix dictates how much of the total CM will come from sales of each product. Unit sales are attributable 40% to racers and 60% to 5-speeds, so 40% of the UCM for racers must be added to 60% of the UCM for 5-speeds to get the weighted-average CM.
- Answer (C) is incorrect because the sales mix dictates how much of the total CM will come from sales of each product. Unit sales are attributable 40% to racers and 60% to 5-speeds, so 40% of the UCM for racers must be added to 60% of the UCM for 5-speeds to get the weighted-average CM.
Answer (D) is correct. Contribution margin equals selling price minus variable costs.

The product contribution margins are:

Racer: \( \$570 - \$200 = \$370 \)

5-Speed: \( \$180 - \$90 = \$90 \)

The sales mix is:

Racer: \( \frac{8,000}{8,000 + 12,000} = 40\% \)

5-Speed: \( \frac{12,000}{8,000 + 12,000} = 60\% \)

Multiply the CM by the sales mix for each product, and add the results.

Weighted-average CM = \((\$370 \times 40\%) + (\$90 \times 60\%))

= \$148 + \$54

= \$202

A not-for-profit social agency provides home health care assistance to as many patients as possible. Its budgeted appropriation \((X)\) for next year must cover fixed costs of \(\$5\) million, and the annual per-patient cost \((Y)\) of its services. However, the agency is preparing for a possible 10% reduction in its appropriation that will lower the number of patients served from 5,000 to 4,000. The reduced appropriation and the annual per-patient cost equal

<table>
<thead>
<tr>
<th>Reduced Appropriation</th>
<th>Per-Patient Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. $5,000,000</td>
<td>$4,000</td>
</tr>
<tr>
<td>B. $8,333,333</td>
<td>$833</td>
</tr>
<tr>
<td>C. $9,000,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>D. $10,000,000</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

Answer (A) is incorrect because the fixed cost is \$5,000,000 and the number served given a reduced appropriation is 4,000.

Answer (B) is incorrect because these amounts are the appropriation and per-patient annual cost, respectively, for the next year that result from a 10% increase in the appropriation of the current year instead of a 10% decrease in the next year’s appropriation.

Answer (C) is correct. This question applies CVP analysis in a not-for-profit context in which the agency wishes to assist as many people as possible. Thus, a breakeven point must be calculated. Total revenue (the appropriation) equals fixed cost plus the product of unit variable cost (per-patient annual cost) and the number of patients who can be assisted given the available resources. The following are simultaneous equations stated in the two unknowns:

\[
X - 5,000Y = 5,000,000 \\
.9X - 4,000Y = 5,000,000
\]

Because \(X\) must equal \(5,000Y + 5,000,000\), the second equation may be solved as follows for the per-patient annual cost \((Y)\):

\[
.9(5,000Y + 5,000,000) - 4,000Y = 5,000,000 \\
4,500Y + 4,500,000 - 4,000Y = 5,000,000 \\
500Y = 500,000 \\
Y = 1,000
\]

Accordingly, the budgeted appropriation \((X)\) must be \$10,000,000 \((5,000 \times \$1,000) VC + \$5,000,000 FC\), and the reduced appropriation must be \$9,000,000 \((10,000,000 \times 90\%)\).
Answer (D) is incorrect because the budgeted appropriation is $10,000,000 and the number of people it would serve is 5,000.

[Fact Pattern #115]
Catfur Company has fixed costs of $300,000. It produces two products, X and Y. Product X has a variable cost percentage equal to 60% of its $10 per unit selling price. Product Y has a variable cost percentage equal to 70% of its $30 selling price. For the past several years, sales of Product X have averaged 66% of the sales of Product Y. That ratio is not expected to change.

[1109] Refers to Fact Pattern #115
What is Catfur’s breakeven point in dollars?

A. $300,000
B. $750,000
C. $857,142
D. $942,857

- Answer (A) is incorrect because this amount equals the fixed costs.
- Answer (B) is incorrect because this amount assumes a 40% contribution margin ratio.
- Answer (C) is incorrect because this amount assumes a 35% contribution margin ratio.
- Answer (D) is correct. A helpful approach in a multiproduct situation is to make calculations based on the composite unit, i.e., 2 units of Product X and 3 units of Product Y (a 66% ratio). The selling price of this composite unit is $110 [(2 × $10) + (3 × $30)]. The UCM of the composite unit is $35 \[(2 \times ($10 – $6)) + (3 \times ($30 – $21))\]. Consequently, the breakeven point in composite units is 8,571.43 ($300,000 FC ÷ $35 UCM), and the breakeven point in sales dollars is $942,857 (8,571.43 × $110).

[1110] Refers to Fact Pattern #115
How many units of Product Y will Catfur sell at the breakeven point?

A. 8,571 units.
B. 20,454 units.
C. 23,377 units.
D. 25,714 units.

- Answer (A) is incorrect because the number of composite units sold at the breakeven point equals 8,571.
- Answer (B) is incorrect because assuming a 40% contribution margin ratio results in 20,454.
- Answer (C) is incorrect because assuming a 35% contribution margin ratio results in 23,377.
- Answer (D) is correct. A composite unit was defined as consisting of 2 units of Product X and 3 units of Product Y. The breakeven point in composite units is 8,571.43. Accordingly, the units of Product Y sold at the breakeven point are equal to 25,714 (8,571.43 × 3).
Assume that Catfur Company achieved its planned break even level of sales in dollars, but the mix of products sold was one-to-one. All actual costs and unit selling prices equaled budgeted amounts. What is the impact on profitability?

A. The company is operating at the breakeven point.  
B. The company earned a profit.  
C. The company sustained a loss.  
D. Cannot be determined from the information given.

- **Answer (A)** is incorrect because The company is profitable due to the higher average contribution margin.  
- **Answer (B)** is correct. The expected sales mix is 40% for Product X and 60% for Product Y. Given that Product X has a 40% contribution margin ratio and Product Y has a 30% contribution margin ratio, selling more of Product X and less of Product Y increases the average contribution margin ratio. The effect is to lower the breakeven point. Thus, if the new composite unit includes 2 units of Product X and 2 units of Product Y, the composite unit selling price is $80 \( [(2 \times 10) + (2 \times 30)] \), and the composite UCM is $26 \( [(2 \times (10 - 6)) + (2 \times (30 - 21))] \). The new breakeven point in composite units is therefore 11,538.46 \( ($300,000 \text{ FC} \div 26 \text{ UCM}) \), and the new breakeven point in sales dollars is $923,077 \( (11,538.46 \times 80) \). Given that sales reached the budgeted breakeven point of $942,857, Catfur must have made a profit of $19,780 \( ($942,857 - $923,077) \).  
- **Answer (C)** is incorrect because The company is profitable due to the higher average contribution margin.  
- **Answer (D)** is incorrect because The company is profitable due to the higher average contribution margin.

MetalCraft produces three inexpensive socket wrench sets that are popular with do-it-yourselfers. Budgeted information for the upcoming year is as follows.

<table>
<thead>
<tr>
<th>Model</th>
<th>Selling Price</th>
<th>Variable Cost</th>
<th>Estimated Sales Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 109</td>
<td>$10.00</td>
<td>$5.50</td>
<td>30,000 sets</td>
</tr>
<tr>
<td>No. 145</td>
<td>15.00</td>
<td>8.00</td>
<td>75,000 sets</td>
</tr>
<tr>
<td>No. 153</td>
<td>20.00</td>
<td>14.00</td>
<td>45,000 sets</td>
</tr>
</tbody>
</table>

Total fixed costs for the socket wrench product line is $961,000. If the company’s actual experience remains consistent with the estimated sales volume percentage distribution, and the firm desires to generate total operating income of $161,200, how many Model No. 153 socket sets will MetalCraft have to sell?

A. 26,000  
B. 54,300  
C. 155,000  
D. 181,000

- **Answer (A)** is incorrect because The total of all three models that must be sold to cover only the desired operating income and not cover fixed costs is 26,000.  
- **Answer (B)** is correct. A composite unit for MetalCraft consists of the proportions 30:75:45, representing percentages of 20%, 50%, and 30%. The per-product contribution margins that will be weighted are $4.50 \( ($10.00 - 5.50) \), $7.00 \( ($15.00 - 8.00) \), and $6.00 \( ($20.00 - 14.00) \). The weighted UCM is therefore $6.20 \( ($4.50 \times 20\%) + ($7.00 \times 50\%) + ($6.00 \times 30\%) \). The total of fixed costs and target operating income is $1,122,200 \( ($961,000 + $161,200) \). The breakeven point in composite units can be found by dividing this total target amount by the weighted UCM \( ($1,122,200 \div 6.20 = 181,000) \). Since Model 153 represents 30% of this, the total of that model produced will be 54,300 \( (181,000 \times 30\%) \).  
- **Answer (C)** is incorrect because The total of all three models that must be sold to cover only the fixed costs and not cover the desired operating income is 155,000.  
- **Answer (D)** is incorrect because The total of all three models that must be sold is 181,000.
Ticker Company sells two products. Product A provides a contribution margin of $3 per unit, and Product B provides a contribution margin of $4 per unit. If Ticker’s sales mix shifts toward Product A, which one of the following statements is correct?

A. The total number of units necessary to break even will decrease.
B. The overall contribution margin ratio will increase.
C. Operating income will decrease if the total number of units sold remains constant.
D. The contribution margin ratios for Products A and B will change.

- Answer (A) is incorrect because the total number of units necessary to break even will increase.
- Answer (B) is incorrect because the overall contribution margin ratio will decrease.
- Answer (C) is correct. Since the lower contribution product now predominates in the sales mix, the composite contribution margin will decrease. Since the number of units sold remains constant, overall contribution margin and operating income will decrease.
- Answer (D) is incorrect because the contribution margin ratios for Products A and B will not change.

Eagle Brand, Inc., produces two products. Data regarding these products are presented below.

<table>
<thead>
<tr>
<th></th>
<th>Product X</th>
<th>Product Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$100</td>
<td>$130</td>
</tr>
<tr>
<td>Variable costs per unit</td>
<td>$80</td>
<td>$100</td>
</tr>
<tr>
<td>Raw materials used per unit</td>
<td>4 lbs.</td>
<td>10 lbs.</td>
</tr>
</tbody>
</table>

Eagle Brand has 1,000 lbs. of raw materials that can be used to produce Products X and Y.

Which one of the alternatives below should Eagle Brand accept in order to maximize contribution margin?

A. 100 units of product Y.
B. 250 units of product X.
C. 200 units of product X and 20 units of product Y.
D. 200 units of product X and 50 units of product Y.

- Answer (A) is incorrect because the amount of 100 units of Product Y does not generate the highest possible contribution margin.
- Answer (B) is correct. The unit contribution margins of Products X and Y respectively are $20 and $30 ($100 – $80 vs. $130 – $100). With 1,000 lbs. of raw materials, Eagle Brand can produce either 250 units of X (1,000 ÷ 4) or 100 units of Y (1,000 ÷ 10). The higher total contribution margin will be attained by producing Product X (250 × $20 = $5,000 vs. 100 × $30 = $3,000). The key is to determine the contribution margin per unit of scarce resource. The $20 margin on Product X requires the use of 4 lbs. of the scarce resource, or a return of $5 per pound ($20 ÷ 4 lbs.). Product Y has a higher margin of $30, but requires 10 lbs. of the scarce resource. Thus, Product Y has a margin of only $3 per pound of the scarce resource. The objective is to maximize the margin per pound of scarce resource.
- Answer (C) is incorrect because the amount of 200 units of product X and 20 units of product Y does not generate the highest possible contribution margin.
- Answer (D) is incorrect because the amount of 200 units of product X and 50 units of product Y does not generate the highest possible contribution margin.
Ace Manufacturing plans to produce two products, Product C and Product F, during the next year, with the following characteristics.

<table>
<thead>
<tr>
<th></th>
<th>Product C</th>
<th>Product F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$10</td>
<td>$15</td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>$8</td>
<td>$10</td>
</tr>
<tr>
<td>Expected sales (units)</td>
<td>20,000</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Total projected fixed costs for the company are $30,000. Assume that the product mix would be the same at the breakeven point as at the expected level of sales of both products. What is the projected number of units (rounded) of Product C to be sold at the breakeven point?

A. 2,308  
B. 9,231  
C. 11,538  
D. 15,000

- Answer (A) is incorrect because the breakeven point for Product F is 2,308 units.  
- Answer (B) is correct. Ace's composite unit contribution margin (composite UCM), given that it sells multiple products, is the combined UCM of the individual products.

\[
\text{Composite UCM} = \left(\frac{10 - 8}{20,000 + 5,000}\right) + \left(\frac{15 - 10}{20,000 + 5,000}\right) = 2 \times 80\% + 5 \times 20\% = 1.60 + 1.00 = 2.60
\]

The total breakeven point is then calculated.

\[
\text{Total BEP in units} = \frac{\text{Fixed costs} + \text{Composite UCM}}{\text{Composite UCM}} = \frac{30,000 + 2.60}{2.60} = 11,538.5
\]

The breakeven point for a single product is its proportion of the total.

\[
\text{BEP for Product C} = \frac{11,538.46}{2.60} \times 80\% = 9,230.4
\]

- Answer (C) is incorrect because the total breakeven point is 11,538 units.  
- Answer (D) is incorrect because the difference between the production levels of the two products is 15,000 units.
TwelCo produces and sells two main products, with contribution margins per unit as follows.

- Product A: $10.00 per unit
- Product B: $8.00 per unit

Fixed costs for the year are budgeted at $264,480, and TwelCo calculated its breakeven point at 28,500 units. What percentage of units sold are expected to be Product A?

A. 36%
B. 44%
C. 56%
D. 64%

- Answer (A) is incorrect because this is the proportion of Product B.
- Answer (B) is incorrect because this answer choice incorrectly calculates the percentage of Product B (not the correct product) units by dividing B’s contribution margin per unit into the total contribution margin of the two units.
- Answer (C) is incorrect because this answer choice incorrectly calculates the percentage of Product A units by dividing A’s contribution margin per unit into the total contribution margin of both units ($10 ÷ $18).
- Answer (D) is correct. The first step is to find the average contribution margin of one unit, $9.28 ($264,480 ÷ 28,500). Then, set the average contribution margin equal to the proportion, X, of Product A, multiplied by Product A’s contribution margin plus the proportion, Y, of Product B, multiplied by Product B’s contribution margin ($9.28 = $10X + $8Y). As X and Y are proportions of 1, either is equal to 1 less the other (Y = 1 – X). Therefore, it is possible to solve for the proportion X algebraically by substituting the Y value in the earlier equation with the later equation, as follows:

\[
\begin{align*}
9.28 &= 10X + 8Y; \quad Y = 1 - X \\
9.28 &= 10X + 8(1-X) \\
9.28 &= 10X + 8 - 8X \\
1.28 &= 2X \\
X &= .64
\end{align*}
\]

Thus, 64% of the contribution margin is contributed by Product A.
National Technology Corporation manufactures integrated computer components. Its unit cost structure, based upon a volume of 300,000 units, is as follows.

<table>
<thead>
<tr>
<th></th>
<th>Variable Cost</th>
<th>Fixed Costs</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct material</td>
<td>$3.50</td>
<td>$3.50</td>
<td>$6.50</td>
</tr>
<tr>
<td>Direct labor</td>
<td>9.00</td>
<td>9.00</td>
<td>9.00</td>
</tr>
<tr>
<td>Packaging</td>
<td>2.00</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Manufacturing O/H</td>
<td>3.00</td>
<td>6.50</td>
<td>9.50</td>
</tr>
<tr>
<td>Marketing costs</td>
<td>2.50</td>
<td>8.00</td>
<td>10.50</td>
</tr>
<tr>
<td>Administrative costs</td>
<td>4.00</td>
<td>4.50</td>
<td>8.50</td>
</tr>
<tr>
<td>Total costs</td>
<td>$24.00</td>
<td>$19.00</td>
<td>$43.00</td>
</tr>
</tbody>
</table>

A foreign company recently approached National with an order of 50,000 units of a specially designed component at $35 per unit. The order will require specialized procurement costs of $150,000, and only one-half of the variable costs associated with the administrative area will be needed. Otherwise, cost behavior will remain the same. Adequate capacity is available to handle this request. What is the relevant unit cost to be considered by National in making a decision on this offer?

A. $43.00  
B. $25.00  
C. $24.00  
D. $22.00

- Answer (A) is incorrect because The amount of $43.00 is representative of the total costs per unit without consideration of the special order. Also, fixed costs that do not change should not be considered in relevant unit cost calculations.
- Answer (B) is correct. The current variable cost per unit must be adjusted as follows:

\[
\text{Beginning value} + 3.00 \text{ Specialized procurement costs} \left( \frac{150,000}{50,000} \text{ units} \right) - 2.00 \text{ Adjustment for one-half of the unneeded variable administrative costs} = 25.00
\]

- Answer (C) is incorrect because The amount of $24.00 is the current variable cost per unit without taking the special order into consideration.
- Answer (D) is incorrect because The amount of $22.00 excludes the adjustment for the specialized procurement costs.

During the previous year, Morrison, Inc., produced 200,000 pogo sticks and sold them all for $10 each. The explicit costs of production were $700,000, and the implicit costs of production were $200,000. The firm had

A. An accounting profit of $1.1 million and an economic profit of $0.  
B. An accounting profit of $1.3 million and an economic profit of $1.1 million.  
C. An accounting profit of $1.3 million and an economic profit of $1.3 million.  
D. An accounting profit of $1.3 million and an economic profit of $1.5 million.

- Answer (A) is incorrect because The $200,000 of implicit costs is not used in computing accounting income.
Answer (B) is correct. Implicit costs are amounts that would have been received if self-owned resources had been used outside the firm’s business. Economic profit is pure profit, or the excess of revenue over both explicit and implicit costs. Revenues of $2 million minus explicit costs of $700,000 result in accounting income of $1.3 million. That amount is reduced by the $200,000 of implicit costs to arrive at economic profit of $1.1 million.

Answer (C) is incorrect because Economic income will be less than accounting income when there are implicit costs.

Answer (D) is incorrect because Implicit costs reduce accounting income rather than increase it.

Answer (A) is incorrect because Economic (pure) profit is the residual return in excess of normal profit. Economic profit equals total revenue minus opportunity costs. These are the sum of explicit and implicit costs, including normal profit.

Answer (B) is incorrect because Accounting profit is the excess of total revenue over explicit costs (out-of-pocket payments to outsiders).

Answer (C) is incorrect because A normal profit is an implicit cost.

Answer (D) is correct. Normal profit is the level of profit necessary to induce entrepreneurs to enter and remain in the market. Economists view this profit as an implicit cost of economic activity.

A corporation’s net income as presented on its income statement is usually

Answer (A) is correct. Economic (pure) profit equals total revenue minus economic costs. Economic costs are defined by economists as total costs, which are the sum of outlay costs, and opportunity costs, which are the values of productive resources in their best alternative uses. The return sufficient to induce the entrepreneur to remain in business (normal profit) is an implicit (opportunity) cost. Net income as computed under generally accepted accounting principles considers only explicit costs, not such implicit costs as normal profit and the opportunity costs associated with not using assets for alternative purposes. Thus, net income will be higher than economic profit because the former fails to include a deduction for opportunity costs, for example, the salary forgone by an entrepreneur who chooses to be self-employed.

Answer (B) is incorrect because Both economists and accountants treat interest as a cost.

Answer (C) is incorrect because Economic profits will be less than net income.

Answer (D) is incorrect because Economic profits will be less than net income.
Companies A, B, and C had the following results for last year as reported on financial statements prepared in conformity with accounting principles generally accepted in the United States:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$100,000</td>
<td>$200,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>60,000</td>
<td>120,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$40,000</td>
<td>$80,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Other expenses</td>
<td>10,000</td>
<td>20,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$30,000</td>
<td>$60,000</td>
<td>$120,000</td>
</tr>
<tr>
<td>Equity</td>
<td>$500,000</td>
<td>$300,000</td>
<td>$900,000</td>
</tr>
</tbody>
</table>

Assets are equal to equity. The company has no long-term debt outstanding. The cost of internally-generated equity capital is 12%. Which company had the highest economic profit?

A. Company A.
B. Company B.
C. Company C.
D. Cannot be determined from information given.

- Answer (A) is incorrect because Company A has a negative economic profit [$30,000 – $60,000 = $(30,000)].
- Answer (B) is correct. Economic profit is the excess of revenues over economic costs, including costs for materials, labor, and the (opportunity) cost of capital. Thus, imputed interest at 12% of equity is subtracted from the accounting profit. Imputed interest is $60,000 for A, $36,000 for B, and $108,000 for C. Accordingly, Company B has the highest economic profit ($60,000 accounting income – $36,000 interest on capital = $24,000).
- Answer (C) is incorrect because Company C’s economic profit is $12,000 ($120,000 – $108,000).
- Answer (D) is incorrect because Company B has the highest economic profit.

The difference between variable costs and fixed costs is

A. Variable costs per unit fluctuate, and fixed costs per unit remain constant.
B. Variable costs per unit are fixed over the short run, and fixed costs per unit are variable.
C. Total variable costs are variable over the short run and fixed in the long term, while fixed costs never change.
D. Variable costs per unit change in varying increments, while fixed costs per unit change in equal increments.

- Answer (A) is incorrect because Variable costs are fixed per unit; they do not fluctuate. Fixed costs per unit change as production changes.
- Answer (B) is correct. Fixed costs remain unchanged for a given period despite fluctuations in activity, but per-unit fixed costs do change as the level of activity changes. Thus, fixed costs are fixed in total but vary per unit as activity changes. Total variable costs vary directly with activity. They are fixed per unit but vary in total.
- Answer (C) is incorrect because All costs are variable in the long term.
- Answer (D) is incorrect because Unit variable costs are fixed in the short term.
Which of the following is the best example of a variable cost?

A. The corporate president’s salary.
B. Cost of raw material.
C. Interest charges.
D. Property taxes.

- Answer (A) is incorrect because the president’s salary usually does not vary with production levels.
- Answer (B) is correct. Variable costs vary directly with the level of production. As production increases or decreases, material cost increases or decreases, usually in a direct relationship.
- Answer (C) is incorrect because interest charges are independent of production levels. They are called “fixed” costs and are elements of overhead.
- Answer (D) is incorrect because property taxes are independent of production levels. They are called “fixed” costs and are elements of overhead.

---

**Fact Pattern #116**

<table>
<thead>
<tr>
<th>Total Units of Product</th>
<th>Average Fixed Cost</th>
<th>Average Variable Cost</th>
<th>Average Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>$15.00</td>
<td>$25.00</td>
<td>$40.00</td>
</tr>
<tr>
<td>7</td>
<td>12.86</td>
<td>24.00</td>
<td>36.86</td>
</tr>
<tr>
<td>8</td>
<td>11.25</td>
<td>23.50</td>
<td>34.75</td>
</tr>
<tr>
<td>9</td>
<td>10.00</td>
<td>23.75</td>
<td>33.75</td>
</tr>
</tbody>
</table>

[1124] (Refers to Fact Pattern #116)

The total cost of producing seven units is

A. $90.02
B. $168.00
C. $258.02
D. $280.00

- Answer (A) is incorrect because this amount is the total fixed cost.
- Answer (B) is incorrect because this amount is the total variable cost.
- Answer (C) is correct. If seven units can be produced at an average cost of $36.86 each, multiplying that amount by seven produces the total cost of $258.02.
- Answer (D) is incorrect because this amount is the total cost if average total cost for seven units were $40.00.
The marginal cost of producing the ninth unit is

A. $23.50  
B. $23.75  
C. $25.75  
D. $33.75

- Answer (A) is incorrect because this amount is the variable cost of the eighth unit.
- Answer (B) is incorrect because this amount is the variable cost of the ninth unit.
- Answer (C) is correct. Marginal cost is the incremental cost of producing one additional unit. Thus, the marginal cost of the ninth unit is the increment over the total cost for eight units. The total cost for eight units at $34.75 each is $278, and the total cost for nine units at $33.75 each is $303.75, so the total cost for nine units is $25.75 greater than the total for eight units. This $25.75 is the marginal cost of the ninth unit.
- Answer (D) is incorrect because this amount is the average cost per unit for nine units.

The change in total product resulting from the use of one unit more of the variable factor is known as

A. The point of diminishing average productivity.  
B. Marginal product.  
C. Marginal cost.  
D. The point of diminishing marginal productivity.

- Answer (A) is incorrect because the point of diminishing average productivity is the point at which average productivity begins to decline as additional units of input are used.
- Answer (B) is correct. Marginal product is the output obtained by adding one extra unit of a variable input factor. If the cost of the input factor is constant, a rising marginal product will result in a declining marginal cost of output. If marginal product is falling, marginal cost is rising. Hence, marginal cost is at a minimum when marginal product is at a maximum.
- Answer (C) is incorrect because marginal cost is the addition to total cost as a result of increasing production by one unit.
- Answer (D) is incorrect because the point of diminishing marginal productivity is that point at which marginal productivity begins to decline as additional inputs are added to production.

If a firm currently producing 500 units of output incurs total fixed costs of $10,000 and total variable costs of $15,000, the average total cost per unit is

A. $20  
B. $30  
C. $50  
D. $25

- Answer (A) is incorrect because using total fixed costs instead of total costs results in $20, which includes total variable costs.
- Answer (B) is incorrect because using total variable costs instead of total costs results in $30, which includes total fixed costs.
- Answer (C) is correct. The average total cost per unit is calculated by dividing total costs (fixed variable) by the number of units produced. Thus, $25,000 divided by 500 units produces a unit cost of $50.
Answer (D) is incorrect because the average of fixed costs per unit and variable costs per unit is $25.

The output and cost information for a firm is presented below.

<table>
<thead>
<tr>
<th>Output</th>
<th>Total Variable Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$0</td>
<td>$100</td>
</tr>
<tr>
<td>1</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td>2</td>
<td>260</td>
<td>360</td>
</tr>
<tr>
<td>3</td>
<td>350</td>
<td>450</td>
</tr>
</tbody>
</table>

The marginal cost of the second unit of output is

A. $100
B. $110
C. $150
D. $180

Answer (A) is incorrect because this amount is the fixed cost of production.
Answer (B) is incorrect. Marginal cost is the additional cost of producing one more unit of output. Because total cost increased from $250 to $360, the marginal cost of the second unit is $110.
Answer (C) is incorrect because this amount is the marginal cost of the first unit of production.
Answer (D) is incorrect because this amount is the average cost of production for two units.

When a firm produces 10,000 units of output, its total variable cost is equal to $50,000. Also, it experiences average fixed costs of $3 per unit. What are the total costs for producing 10,000 units?

A. $30,000
B. $50,000
C. $50,003
D. $80,000

Answer (A) is incorrect because this amount represents only the fixed costs.
Answer (B) is incorrect because this amount represents only the variable costs.
Answer (C) is incorrect because the total fixed costs are $30,000, not $3.
Answer (D) is correct. A firm’s total costs consist of both variable and fixed costs. If the average fixed cost for 10,000 units is $3, the total fixed costs are $30,000. Adding the $30,000 of fixed costs to the $50,000 of variable costs produces total costs of $80,000.

Regardless of output, a firm has $4,000 a year in total fixed costs. This same firm has an average variable cost of $3 while producing 1,000 units of output. If the firm decides to produce 1,000 units, what will be its average total cost?

A. $1.00
B. $3.00
C. $4.00
D. $7.00
Answer (A) is incorrect because The average variable cost is added to, not subtracted from, the average fixed cost.
Answer (B) is incorrect because This amount is the variable cost, not the total cost.
Answer (C) is incorrect because This amount is only the fixed cost per unit, not the total cost.
Answer (D) is correct. At a production level of 1,000 units, the average fixed cost is $4 ($4,000 ÷ 1,000 units). Adding the $4 of average fixed cost to the $3 of average variable cost produces a total cost of $7.

A firm produces only 5 units of output. If total variable cost is $400 and total fixed cost is $200, then

A. Marginal cost is $120.
B. Average total cost is $600.
C. Average fixed cost is $200.
D. Average variable cost is $80.

Answer (A) is incorrect because The marginal cost cannot be accurately determined from the information given but is most likely equal to the $80 of unit variable cost.
Answer (B) is incorrect because The average total cost is $120.
Answer (C) is incorrect because The average fixed cost is $40.
Answer (D) is correct. If total variable cost is $400 for 5 units, the average variable cost is $80. The average fixed cost is $40 ($200 ÷ 5), and the average total cost is $120 ($80 + $40).

If a firm’s fixed costs are $500 and its average variable costs stay constant despite various levels of output, which of the following must be true?

A. Marginal cost will equal average total cost.
B. Marginal cost will be less than average variable cost.
C. Average total cost will decrease when output is increased.
D. Average total cost will be constant.

Answer (A) is incorrect because Marginal cost will be less than average total cost.
Answer (B) is incorrect because Marginal cost will be equal to average variable cost.
Answer (C) is correct. Since fixed costs are fixed in total, they will decline per unit as production increases. Thus, average total cost will decrease when output is increased.
Answer (D) is incorrect because Average total cost will decline since fixed costs are constant in total.

The sum of the average fixed costs and the average variable costs for a given output is known as

A. Long-run average cost.
B. Average product.
C. Total cost.
D. Average total cost.

Answer (A) is incorrect because The use of fixed costs implies a short-run analysis.
Answer (B) is incorrect because Average product is a nonsense term.
Answer (C) is incorrect because the combination of two average costs produces an average cost, not a total cost.

Answer (D) is correct. The sum of the average fixed costs and the average variable costs for a given output is the average total cost.

The definition of economic cost is

A. All the dollar costs employers pay for all inputs purchased.
B. The opportunity cost of all inputs minus the dollar cost of those inputs.
C. The difference between all implicit and explicit costs of the business firm.
D. The sum of all explicit and implicit costs of the business firm.

Answer (A) is incorrect because economic cost includes not only explicit costs (dollars paid), but implicit costs as well; implicit costs include opportunity costs.

Answer (B) is incorrect because opportunity costs and dollar costs should be added, not subtracted.

Answer (C) is incorrect because all explicit and implicit costs should be added, not subtracted.

Answer (D) is correct. Economic cost is defined as the sum of all costs, both implicit and explicit, of a firm. Explicit costs include direct expenditures made to those outside the firm, for example, the costs of labor, materials, and equipment. Implicit costs are the payments that would have been received if self-owned resources had been used outside the firm’s business. Thus, the lease payments forgone by not renting the firm’s building to others is an implicit cost. The return necessary to keep resources employed in a given enterprise (normal profit) is also an implicit cost.

From the following information, calculate economic profit:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total sales revenue</td>
<td>$600,000</td>
</tr>
<tr>
<td>Total cost of sales</td>
<td>200,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>50,000</td>
</tr>
<tr>
<td>General and administrative expenses</td>
<td>25,000</td>
</tr>
<tr>
<td>Forgone interest</td>
<td>20,000</td>
</tr>
<tr>
<td>Forgone entrepreneurial income</td>
<td>15,000</td>
</tr>
</tbody>
</table>

A. $400,000  
B. $325,000  
C. $305,000  
D. $290,000  

Answer (A) is incorrect because this amount is the gross margin.

Answer (B) is incorrect because this amount is the accounting profit.

Answer (C) is incorrect because failing to recognize the forgone entrepreneurial income as an implicit cost results in $305,000.
Answer (D) is correct. Explicit costs are those requiring actual cash disbursements. For this reason, they are sometimes called out-of-pocket or outlay costs. Explicit costs are accounting costs, that is, they are recognized in a concern’s formal accounting records. This firm’s explicit costs total $275,000, consisting of cost of sales, selling expenses, and general and administrative expenses. Implicit costs are those costs not recognized in a concern’s formal accounting records. Implicit costs are opportunity costs, i.e., the maximum benefit forgone by using a scarce resource for a given purpose and not for the next-best alternative. This firm’s implicit costs total $35,000, consisting of forgone interest and forgone entrepreneurial income. Accounting profits are earned when the (book) income of an organization exceeds the (book) expenses. This firm’s accounting profit is $325,000 ($600,000 – $275,000). Economic profits are a significantly higher hurdle. They are not earned until the organization’s income exceeds not only costs as recorded in the accounting records, but the firm’s implicit costs as well. Economic profit is also called pure profit. This firm’s economic profit is thus $290,000 ($600,000 – $275,000 – $35,000).

[Fact Pattern #117]

Jennilyn Jasper, whose annual salary as a flight instructor is $40,000, has just inherited $100,000 after taxes. She is considering quitting her job and opening a day-care center. Certificates of deposit at the local bank are currently paying 6%. Jennilyn estimates that she will have to pay $120,000 in salaries to employees per year, $20,000 to rent a building, $9,000 each for furniture and supplies, $80,000 for insurance, and $7,000 for utilities.

[1136](Refers to Fact Pattern #117)

The two most important cost figures Jennilyn must consider in projecting profitability for her day-care center are, respectively, the explicit and implicit costs of

A. $245,000 and $46,000.
B. $245,000 and $140,000.
C. $100,000 and $46,000.
D. $100,000 and $40,000.

Answer (A) is correct. Explicit costs are those requiring actual cash disbursements. For this reason, they are sometimes called out-of-pocket or outlay costs. In Jennilyn’s case, they total $245,000 ($120,000 salaries + $20,000 rent + $9,000 furniture + $9,000 supplies + $80,000 insurance + $7,000 utilities). Implicit costs are those costs not recognized in a concern’s formal accounting records. Implicit costs are opportunity costs, i.e., the maximum benefit forgone by using a scarce resource for a given purpose and not for the next-best alternative. For Jennilyn, these consist of the salary forgone by quitting her job ($40,000) plus the the interest she could have earned by simply investing the inheritance instead of plowing it into the business ($100,000 × 6% = $6,000)

Answer (B) is incorrect because While $245,000 accurately captures Jennilyn’s explicit costs, $140,000 improperly counts the full amount of her inheritance as an opportunity cost.

Answer (C) is incorrect because While $46,000 accurately captures Jennilyn’s implicit costs, her explicit costs consist of considerably more than $100,000.

Answer (D) is incorrect because Jennilyn’s explicit costs exceed $100,000 and her implicit costs exceed $40,000.

[1137](Refers to Fact Pattern #117)

If Jennilyn’s projections are accurate and she earns $250,000 in revenue from the business, she will have incurred

A. Neither an accounting nor an economic profit.
B. An accounting profit but not an economic profit.
C. An economic profit but not an accounting profit.
D. Both an accounting profit and an economic profit.
Answer (A) is incorrect because Jennilyn would earn an accounting profit of $5,000.

Answer (B) is correct. An accounting profit is the excess of revenues over explicit costs, in this case ($250,000 revenue) – ($120,000 salaries + $20,000 rent + $9,000 furniture + $9,000 supplies + $80,000 insurance + $7,000 utilities) = $5,000. An economic profit is a significantly higher hurdle. It is not earned until the organization’s income exceeds not only costs as recorded in the accounting records, but the firm’s implicit costs as well. In this case, the most important implicit costs are Jennilyn’s forgone salary ($40,000) and the interest she could have earned by simply investing the inheritance instead of plowing it into the business ($100,000 × 6%). Since the combined implicit costs of $46,000 exceed the accounting profit of $5,000, Jennilyn would incur an accounting profit but an economic loss.

Answer (C) is incorrect because Jennilyn would earn an accounting profit but not an economic profit.

Answer (D) is incorrect because While Jennilyn would earn an accounting profit, she would incur an economic loss.

[Fact Pattern #118]
A company produced the following data (rounded) on its product:

<table>
<thead>
<tr>
<th>Number of Units Produced</th>
<th>Unit Cost</th>
<th>Marginal Cost</th>
<th>Marginal Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed</td>
<td>Variable</td>
<td>Total</td>
</tr>
<tr>
<td>1</td>
<td>$100</td>
<td>$85</td>
<td>$185</td>
</tr>
<tr>
<td>2</td>
<td>50</td>
<td>70</td>
<td>120</td>
</tr>
<tr>
<td>3</td>
<td>33</td>
<td>65</td>
<td>98</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>67</td>
<td>92</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>75</td>
<td>95</td>
</tr>
</tbody>
</table>

[1138](Refers to Fact Pattern #118)

How many units should be produced?

A. 2 units.
B. 3 units.
C. 4 units.
D. 5 units.

Answer (A) is incorrect because Two units of production is not the highest level of production where marginal revenue exceeds marginal costs. Production should continue up to and until marginal revenue equals marginal cost.

Answer (B) is incorrect because Four units could be produced and still increase the company’s profits.

Answer (C) is correct. Marginal revenue exceeds marginal cost for the fourth but not the fifth unit. Production should continue until marginal cost equals marginal revenue. Accordingly, four units should be produced.

Answer (D) is incorrect because At 5 units of production, the marginal cost ($107) exceeds the marginal revenue ($90) so the company would lose income by producing this unit.
If two units of product were produced and sold, the total contribution margin would be

A. $25  
B. $40  
C. $50  
D. $70

- Answer (A) is incorrect because the contribution margin equals the total revenue $180 (2 × $90) minus the variable costs $140 (2 × $70).
- Answer (B) is correct. Contribution margin is defined as total revenue minus variable costs. Total revenue for two units is $180 (2 × $90 marginal revenue), and total variable costs are $140 (2 × $70 unit cost). The total contribution margin is $40 ($180 – $140).
- Answer (C) is incorrect because the contribution margin equals the total revenue $180 (2 × $90) minus the variable costs $140 (2 × $70).
- Answer (D) is incorrect because the contribution margin equals the total revenue $180 (2 × $90) minus the variable costs $140 (2 × $70).

An organization’s sales revenue is expected to be $72,600, a 10% increase over last year. For the same period, total fixed costs of $22,000 are expected to be the same as last year. If the number of units sold is expected to increase by 1,100, the marginal revenue per unit will be

A. $4  
B. $6  
C. $20  
D. $46

- Answer (A) is incorrect because the marginal revenue per unit is equal to the increase in revenue divided by the increase in units sold.
- Answer (B) is correct. Marginal revenue (MR) is the incremental revenue for each additional unit sold (increase in revenue ÷ increase in units sold). If expected revenue of $72,600 is a 10% increase over that for the prior year, the prior year’s revenue must have been $66,000 ($72,600 ÷ 110%).

\[
MR = \frac{72,600 - 66,000}{1,100} = \frac{6,600}{1,100} = 6
\]

- Answer (C) is incorrect because the total fixed costs ($22,000) divided by the increase in sales (1,100) is $20. The marginal revenue per unit is equal to the increase in revenue divided by the increase in units sold.
- Answer (D) is incorrect because the marginal revenue per unit is equal to the increase in revenue divided by the increase in units sold, not the difference of expected sales minus fixed costs, divided by the unit increase in sales.
Parker Manufacturing is analyzing the market potential for its specialty turbines. Parker developed pricing and cost structures for its specialty turbines over various relevant ranges. The pricing and cost data for each relevant range are presented below.

<table>
<thead>
<tr>
<th>Units produced and sold</th>
<th>1 – 5</th>
<th>6 – 10</th>
<th>11 – 15</th>
<th>16 – 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fixed costs</td>
<td>$200,000</td>
<td>$400,000</td>
<td>$600,000</td>
<td>$800,000</td>
</tr>
<tr>
<td>Unit variable cost</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$45,000</td>
<td>$45,000</td>
</tr>
<tr>
<td>Unit selling price</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

Which one of the following production/sales levels would produce the highest operating income for Parker?

A. 8 units.
B. 10 units.
C. 14 units.
D. 17 units.

- Answer (A) is incorrect because Operating income is $0 at 8 units.
- Answer (B) is incorrect because Operating income is lower at 10 units than at either 14 or 17 units.
- Answer (C) is correct. Unit contribution margin can be used to determine which of the production/sales levels listed produces the highest operating income:

<table>
<thead>
<tr>
<th>Selling price</th>
<th>6 – 10</th>
<th>6 – 10</th>
<th>11 – 15</th>
<th>16 – 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: variable costs</td>
<td>($50,000)</td>
<td>($50,000)</td>
<td>($45,000)</td>
<td>($45,000)</td>
</tr>
<tr>
<td>Per unit contr. margin</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$55,000</td>
<td>$55,000</td>
</tr>
<tr>
<td>Times: unit sales</td>
<td>× 8</td>
<td>× 10</td>
<td>× 14</td>
<td>× 17</td>
</tr>
<tr>
<td>Total contribution margin</td>
<td>$400,000</td>
<td>$500,000</td>
<td>$770,000</td>
<td>$935,000</td>
</tr>
<tr>
<td>Less: fixed costs</td>
<td>($400,000)</td>
<td>($400,000)</td>
<td>($600,000)</td>
<td>($800,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td>$0</td>
<td>$100,000</td>
<td>$170,000</td>
<td>$135,000</td>
</tr>
</tbody>
</table>

- Answer (D) is incorrect because Operating income is lower at 17 units than at 14 units.

Nerney Company produces valves for the plumbing industry. Nerney’s per-unit sales price and variable costs are as follows.

Sales price $12
Variable costs 8

Nerney’s practical plant capacity is 40,000 units. Nerney’s total fixed costs aggregate $48,000, and it has a 40% effective tax rate. The maximum net profit that Nerney can earn is

A. $48,000
B. $67,200
C. $96,000
D. $112,000

- Answer (A) is incorrect because The amount of fixed costs is $48,000.
Answer (B) is correct. Nerney’s maximum net profit can be calculated as follows:

\[
\begin{align*}
\text{Selling price} & \quad \$12 \\
\text{Less: variable costs} & \quad (8) \\
\text{Contribution margin per unit} & \quad $4 \\
\text{Times: unit sales} & \quad \times \ 40,000 \\
\text{Total contribution margin} & \quad $160,000 \\
\text{Less: fixed costs} & \quad (48,000) \\
\text{Operating income} & \quad $112,000 \\
\text{Less: income taxes (40\%)} & \quad (44,800) \\
\text{Net profit} & \quad $67,200
\end{align*}
\]

Answer (C) is incorrect because The amount of $96,000 results from failing to subtract the fixed costs.  
Answer (D) is incorrect because The operating profit before taxes is $112,000.

Dayton Corporation manufactures pipe elbows for the plumbing industry. Dayton’s per-unit sales price and variable costs are as follows.

\[
\begin{align*}
\text{Sales price} & \quad $10 \\
\text{Variable costs} & \quad 7
\end{align*}
\]

Dayton’s practical plant capacity is 35,000 units. Dayton’s total fixed costs amount to $42,000, and the company has a 50% effective tax rate. If Dayton produced and sold 30,000 units, net income would be

A. $24,000  
B. $45,000  
C. $48,000  
D. $90,000

Answer (A) is correct. Dayton’s net income at a sales level of 30,000 units can be calculated as follows:

\[
\begin{align*}
\text{Selling price} & \quad $10 \\
\text{Less: variable costs} & \quad (7) \\
\text{Contribution margin per unit} & \quad $3 \\
\text{Times: unit sales} & \quad \times \ 30,000 \\
\text{Total contribution margin} & \quad $90,000 \\
\text{Less: fixed costs} & \quad (42,000) \\
\text{Operating income} & \quad $48,000 \\
\text{Less: income taxes (50\%)} & \quad (24,000) \\
\text{Net profit} & \quad $24,000
\end{align*}
\]

Answer (B) is incorrect because The amount of $45,000 results from failing to subtract fixed costs.  
Answer (C) is incorrect because Operating profit before taxes is $48,000.  
Answer (D) is incorrect because The contribution margin is $90,000.
Lozier and Company produces educational software. Its current unit cost, based upon an anticipated volume of 150,000 units, is as follows.

- **Selling price**: $150
- **Variable costs**: 60
- **Contribution margin**: 90
- **Fixed costs**: 60
- **Operating income**: 30

Sales for the coming year are estimated at 175,000 units, which is within the relevant range of Lozier’s cost structure. Cost management initiatives are expected to yield a 20% reduction in variable costs and a reduction of $750,000 in fixed costs. Lozier’s cost structure for the coming year will include

A. Per-unit contribution margin of $72 and fixed costs of $55.
B. Total contribution margin of $15,300,000 and fixed costs of $8,250,000.
C. Variable cost ratio of 32% and operating income of $9,600,000.
D. Contribution margin ratio of 68% and operating income of $7,050,000.

- Answer (A) is incorrect because Per-unit fixed costs of $55 result from improperly allocating the total fixed costs for 175,000 units to 150,000 units.
- Answer (B) is incorrect because A contribution margin of $15,300,000 results from applying the reduced variable costs to 150,000 units rather than 175,000.
- Answer (C) is correct. Lozier’s budgeted operating results using standard costs can be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Per Unit Amounts</th>
<th>Standard Units</th>
<th>Standard Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$150</td>
<td>150,000</td>
<td>$22,500,000</td>
</tr>
<tr>
<td>Less: variable costs</td>
<td>(60)</td>
<td>150,000</td>
<td>(9,000,000)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td></td>
<td></td>
<td>$13,500,000</td>
</tr>
<tr>
<td>Less: fixed costs</td>
<td>(60)</td>
<td>150,000</td>
<td>(9,000,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td></td>
<td></td>
<td>$4,500,000</td>
</tr>
</tbody>
</table>

Three changes are anticipated: an increase in unit sales, a 20% reduction in variable costs, and a $750,000 reduction in fixed costs. The effects of these changes are reflected below:

<table>
<thead>
<tr>
<th></th>
<th>Per Unit Amounts</th>
<th>Budgeted Units</th>
<th>Budgeted Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$150</td>
<td>175,000</td>
<td>$26,250,000</td>
</tr>
<tr>
<td>Less: variable costs</td>
<td>(48)</td>
<td>175,000</td>
<td>(8,400,000)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td></td>
<td></td>
<td>$17,850,000</td>
</tr>
<tr>
<td>Less: fixed costs</td>
<td>(8,250)</td>
<td></td>
<td>(8,250,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td></td>
<td></td>
<td>$9,600,000</td>
</tr>
</tbody>
</table>

The new ratio of variable costs to sales is 32% ($48 ÷ $150).
- Answer (D) is incorrect because Operating income of $7,050,000 results from using 150,000 units rather than 175,000.
Two months ago, Hickory Corporation purchased 4,500 pounds of Kaylene at a cost of $15,300. The market for this product has become very strong, with the price jumping to $4.05 per pound. Because of the demand, Hickory can buy or sell Kaylene at this price. Hickory recently received a special order inquiry that would require the use of 4,200 pounds of Kaylene. In deciding whether to accept the order, management must evaluate a number of decision factors. Without regard to income taxes, which one of the following combination of factors correctly depicts relevant and irrelevant decision factors, respectively?

<table>
<thead>
<tr>
<th>Relevant Decision Factor</th>
<th>Irrelevant Decision Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Remaining 300 pounds of Kaylene</td>
<td>Market price of $4.05 per lb.</td>
</tr>
<tr>
<td>B. Market price of $4.05 per lb.</td>
<td>Purchase price of $3.40 per lb.</td>
</tr>
<tr>
<td>C. Purchase price of $3.40 per lb.</td>
<td>Market price of $4.05 per lb.</td>
</tr>
<tr>
<td>D. 4,500 pounds of Kaylene</td>
<td>Remaining 300 pounds of Kaylene.</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because the remaining 300 pounds of Kaylene can be sold at the market price of $4.05 per lb.
- Answer (B) is correct. The price that Hickory must pay for Kaylene (or can sell its current stock for) is a relevant factor. The sunk cost of the Kaylene already purchased is irrelevant.
- Answer (C) is incorrect because the purchase price is irrelevant and the market price is relevant.
- Answer (D) is incorrect because the quantities are not relevant.

Stanhope & Company produces educational software. Its unit cost structure, based upon an anticipated production volume of 150,000 units, is as follows:

<table>
<thead>
<tr>
<th>Sales price</th>
<th>Variable costs</th>
<th>Fixed costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$160</td>
<td>60</td>
<td>55</td>
</tr>
</tbody>
</table>

The marketing department has estimated sales for the coming year at 175,000 units, which is within the relevant range of Stanhope’s cost structure. Stanhope’s breakeven volume (in units) and anticipated operating income for the coming year would amount to

A. 82,500 units and $7,875,000 of operating income.
B. 82,500 units and $9,250,000 of operating income.
C. 96,250 units and $3,543,750 of operating income.
D. 96,250 units and $7,875,000 of operating income.

- Answer (A) is incorrect because an operating income of $7,875,000 results from multiplying per-unit fixed costs by 175,000 units rather than 150,000.
- Answer (B) is correct. Stanhope’s budgeted operating income for the coming year can be calculated as follows:

<table>
<thead>
<tr>
<th>Per Unit Amounts</th>
<th>Units</th>
<th>Budgeted Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$160</td>
<td>$28,000,000</td>
</tr>
<tr>
<td>Less: variable costs</td>
<td>(60)</td>
<td>(10,500,000)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$17,500,000</td>
<td></td>
</tr>
<tr>
<td>Less: fixed costs</td>
<td>(55)</td>
<td>(8,250,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td></td>
<td>$9,250,000</td>
</tr>
</tbody>
</table>

The breakeven point in units equals fixed costs divided by unit contribution margin \(\left\lceil\frac{8,250,000}{160 - 60}\right\rceil = 82,500\).
Answer (C) is incorrect because the figure of 96,250 units results from calculating fixed costs with 175,000 units rather than 150,000.

Answer (D) is incorrect because the figure of 96,250 units and an operating income of $7,875,000 result from calculating fixed costs with 175,000 units rather than 150,000.

Verla Industries is trying to decide which one of the following two options to pursue. Either option will take effect on January 1st of the next year.

**Option One -- Acquire a New Finishing Machine**

The cost of the machine is $1,000,000 and will have a useful life of 5 years. Net pre-tax cash flows arising from savings in labor costs will amount to $100,000 per year for 5 years. Depreciation expense will be calculated using the straight-line method for both financial and tax reporting purposes. As an incentive to purchase, Verla will receive a trade-in allowance of $50,000 on its current fully depreciated finishing machine.

**Option Two -- Outsource the Finishing Work**

Verla can outsource the work to LM, Inc., at a cost of $200,000 per year for 5 years. If it outsources, Verla will scrap its current fully depreciated finishing machine.

Verla's effective income tax rate is 40%. The weighted-average cost of capital is 10%.

When comparing the two options, the $50,000 trade-in allowance would be considered.

A. Irrelevant because it does not affect taxes.
B. Relevant because it is a decrease in cash outflow.
C. Irrelevant because it does not affect cash.
D. Relevant because it is an increase in cash outflows.

- Answer (A) is incorrect because the effect on taxes is not the criterion for whether an inflow or outflow is relevant.
- Answer (B) is correct. To be relevant to a decision, an inflow or outflow must (1) take place in the future (i.e., not be a sunk cost) and (2) vary between alternatives. Since the trade-in allowance will be received in the future and since it is only associated with Option One, it is relevant to the decision.
- Answer (C) is incorrect because the trade-in allowance does affect cash.
- Answer (D) is incorrect because the trade-in allowance is a decrease in cash outflows.
Reynolds, Inc., manufactures several different products, including a premium lawn fertilizer and weed killer that is popular in hot, dry climates. Reynolds is currently operating at less than full capacity because of market saturation for lawn fertilizer. Sales and cost data for a 40-pound bag of Reynolds lawn fertilizer is as follows.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$18.50</td>
</tr>
<tr>
<td>Production cost:</td>
<td></td>
</tr>
<tr>
<td>Materials and labor</td>
<td>$12.25</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>3.75</td>
</tr>
<tr>
<td>Allocated fixed overhead</td>
<td>4.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$20.00</td>
</tr>
<tr>
<td>Income (loss) per bag</td>
<td>$(1.50)</td>
</tr>
</tbody>
</table>

On the basis of this information, which one of the following alternatives should be recommended to Reynolds management?

A. Select a different cost driver to allocate its overhead.
B. Drop this product from its product line.
C. Continue to produce and market this product.
D. Increase output and spread fixed overhead over a larger volume base.

- Answer (A) is incorrect because the allocated overhead is not traceable to this product; using a different driver will not provide better information.
- Answer (B) is incorrect because the fertilizer is generating some margin to cover fixed costs.
- Answer (C) is correct. The relevant margin on this product is $2.50, not a loss of $(1.50). The fertilizer is covering all of its variable costs with some left over to cover fixed costs (the fixed costs that have been allocated are not traceable to this product).
- Answer (D) is incorrect because the overhead is allocated, not traceable.

In differential cost analysis, which one of the following best fits the description of a sunk cost?

A. Direct materials required in the manufacture of a table.
B. Purchasing department costs incurred in acquiring material.
C. Cost of the forklift driver to move the material to the manufacturing floor.
D. Cost of a large crane used to move materials.

- Answer (A) is incorrect because the direct materials have not been consumed yet, that is, they have yet to be recognized in cost of goods sold.
- Answer (B) is incorrect because the direct materials have not been consumed yet, that is, they have yet to be recognized in cost of goods sold.
- Answer (C) is incorrect because the cost of the forklift driver has yet to be recognized in cost of goods sold.
- Answer (D) is correct. A sunk cost is one that has already been incurred. Only the crane fits this description.
Capital Company has decided to discontinue a product produced on a machine purchased 4 years ago at a cost of $70,000. The machine has a current book value of $30,000. Due to technologically improved machinery now available in the marketplace the existing machine has no current salvage value. The company is reviewing the various aspects involved in the production of a new product. The engineering staff advised that the existing machine can be used to produce the new product. Other costs involved in the production of the new product will be materials of $20,000 and labor priced at $5,000.

Ignoring income taxes, the costs relevant to the decision to produce or not to produce the new product would be

A. $25,000  
B. $30,000  
C. $55,000  
D. $95,000

- Answer (A) is correct. The only relevant costs are those not yet incurred. Thus, the historical cost and book value of the machine are irrelevant to any future action. Only the incremental materials and labor needed to bring the machine into readiness to produce the new product have relevance since these amounts have not yet been spent ($20,000 + $5,000 = $25,000).
- Answer (B) is incorrect because The $30,000 book value is irrelevant.
- Answer (C) is incorrect because The sum of the book value and the incremental costs to refurbish the machine is $55,000.
- Answer (D) is incorrect because The sum of the historical cost and the incremental costs to refurbish the machine is $95,000.

In a joint manufacturing process, joint costs incurred prior to a decision as to whether to process the products after the split-off point should be viewed as

A. Sunk costs.  
B. Relevant costs.  
C. Standard costs.  
D. Differential costs.

- Answer (A) is correct. Joint costs incurred prior to the split-off point are not relevant to the decision whether or not to process further because they have already been incurred, i.e., they are sunk costs.
- Answer (B) is incorrect because Joint costs incurred prior to the split-off point are not relevant.
- Answer (C) is incorrect because Joint costs incurred prior to the split-off point are sunk costs, not standard costs.
- Answer (D) is incorrect because Differential costs are costs that vary between alternatives.

Profits that are lost by moving an input from one use to another are referred to as

A. Out-of-pocket costs.  
B. Cannibalization charges.  
C. Replacement costs.  
D. Opportunity costs.

- Answer (A) is incorrect because The lost profits are opportunity costs, not out-of-pocket costs.
- Answer (B) is incorrect because The lost profits are opportunity costs, not cannibalization charges.
- Answer (C) is incorrect because The lost profits are opportunity costs, not replacement costs.
Answer (D) is correct. An opportunity cost is the cost of using a scarce resource for one purpose rather than another. The profit lost by applying a resource to a different product is one opportunity cost that must be considered.

[1153] In a management decision process, the cost measurement of the benefits sacrificed due to selecting an alternative use of resources is most often referred to as (n)

A. Relevant cost.
B. Sunk cost.
C. Opportunity cost.
D. Differential cost.

- Answer (A) is incorrect because while opportunity costs are relevant costs, opportunity cost is the most precise definition of the ones offered.
- Answer (B) is incorrect because a sunk cost is one already incurred.
- Answer (C) is correct. An opportunity cost is the cost of using a scarce resource for one purpose rather than another.
- Answer (D) is incorrect because a differential cost is one that varies between alternatives.

[1154] Allred Company sells its single product for $30 per unit. The contribution margin ratio is 45%, and fixed costs are $10,000 per month. Allred has an effective income tax rate of 40%. If Allred sells 1,000 units in the current month, Allred’s variable expenses would be

A. $9,900
B. $12,000
C. $13,500
D. $16,500

- Answer (A) is incorrect because the amount of $9,900 results from improperly applying a variable cost ratio of 33% rather than the correct ratio of (1 – contribution margin ratio).
- Answer (B) is incorrect because the amount of $12,000 results from applying the tax rate rather than the variable cost ratio (1 – contribution margin ratio).
- Answer (C) is incorrect because the amount of $13,500 results from reversing the gross margin ratio.
- Answer (D) is correct. Allred’s contribution margin ratio reveals that 45% of the sales price of each product is contribution margin. Thus, 55% of the sales price goes to variable costs (100% – 45%), making the per-unit variable cost $16.50 ($30 × 55%). Since Allred sold 1,000 units in the current month, total variable costs were $16,500 (1,000 × $16.50).

[1155] Jeffrey Company sells its single product for $30 per unit. The contribution margin ratio is 45%, and fixed costs are $10,000 per month. Sales were 3,000 units in April and 4,000 units in May. How much greater is the May income than the April income?

A. $10,000
B. $13,500
C. $16,500
D. $30,000

- Answer (A) is incorrect because the amount of fixed costs is $10,000.
Answer (B) is correct. Jeffrey’s contribution margin ratio reveals that 45% of the sales price of each product is contribution margin ($30 × 45% = $13.50). Thus, the excess of May income over April is $13,500 (1,000 × $13.50). Fixed costs do not vary between April and May.

Answer (C) is incorrect because The amount of additional variable costs is $16,500.

Answer (D) is incorrect because The difference in sales revenue is $30,000.

For the year just ended, Silverstone Company’s sales revenue was $450,000. Silverstone’s fixed costs were $120,000 and its variable costs amounted to $270,000. For the current year, sales are forecasted at $500,000. If the fixed costs do not change, Silverstone’s profits this year will be

A. $60,000
B. $80,000
C. $110,000
D. $200,000

Answer (A) is incorrect because The prior year profit is $60,000.

Answer (B) is correct. Silverstone’s prior year operating income is calculated as follows:

Sales revenue $450,000
Less: variable costs (270,000)
Contribution margin $180,000
Less: fixed costs (120,000)
Operating income $60,000

Silverstone’s contribution margin ratio is therefore 40% ($180,000 ÷ $450,000), meaning that of every additional dollar of sales, 40% is contribution margin. Thus, this year’s projected increase of $50,000 in sales will result in a $20,000 increase in contribution margin ($50,000 × 40%). Total contribution margin will be $200,000 ($180,000 + $20,000), and since fixed costs are unchanged, total profits will be $80,000 ($60,000 + $20,000).

Answer (C) is incorrect because The amount of $110,000 results from failing to maintain the contribution margin.

Answer (D) is incorrect because This year’s estimated contribution margin is $200,000.

Breeze Company has a contribution margin of $4,000 and fixed costs of $1,000. If the total contribution margin increases by $1,000, operating profit would

A. Decrease by $1,000.
B. Increase by more than $1,000.
C. Increase by $1,000.
D. Remain unchanged.

Answer (A) is incorrect because Operating profit will increase by $1,000.

Answer (B) is incorrect because A change in contribution margin results in an identical change in operating profit within the relevant range.

Answer (C) is correct. Since fixed costs remain unchanged, a change in contribution margin results in an identical change in operating profit within the relevant range.

Answer (D) is incorrect because A change in contribution margin results in an identical change in operating profit within the relevant range.
Wilkinson Company sells its single product for $30 per unit. The contribution margin ratio is 45%, and Wilkinson has fixed costs of $10,000 per month. If 3,000 units are sold in the current month, Wilkinson’s income would be

A. $30,500  
B. $49,500  
C. $40,500  
D. $90,000  

- Answer (A) is correct. Wilkinson’s contribution margin ratio reveals that 45% of the sales price of each product is contribution margin ($30 \times 45% = $13.50). Thus, sales of 3,000 units will produce total revenues of $40,500 (3,000 \times $13.50). Since fixed costs are $10,000, income for the month is $30,500 ($40,500 – $10,000).
- Answer (B) is incorrect because Variable cost for the month is $49,500.
- Answer (C) is incorrect because Contribution margin for the month is $40,500.
- Answer (D) is incorrect because Revenue for the month is $90,000.

In order to avoid pitfalls in relevant-cost analysis, management should focus on

A. Variable cost items that differ for each alternative.  
B. Long-run fixed costs of each alternative.  
C. Anticipated fixed costs and variable costs of all alternatives.  
D. Anticipated revenues and costs that differ for each alternative.  

- Answer (A) is incorrect because Other cost and revenue items can vary between alternatives as well.  
- Answer (B) is incorrect because Other cost and revenue items can vary between alternatives as well.  
- Answer (C) is incorrect because Revenue items can vary between alternatives as well.  
- Answer (D) is correct. Relevant revenues and costs are those that (1) occur in the future and (2) vary between alternatives. The analysis of these differences is the basis of relevant-cost analysis.

The Doll House, a very profitable company, plans to introduce a new type of doll to its product line. The sales price and costs for the new dolls are as follows.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per doll</td>
<td>$100</td>
</tr>
<tr>
<td>Variable cost per doll</td>
<td>$60</td>
</tr>
<tr>
<td>Incremental annual fixed costs</td>
<td>$456,000</td>
</tr>
<tr>
<td>Income tax rate</td>
<td>30%</td>
</tr>
</tbody>
</table>

If 10,000 new dolls are produced and sold, the effect on Doll House’s profit (loss) would be

A. $(176,000)  
B. $(56,000)  
C. $(39,200)  
D. $280,000  

- Answer (A) is incorrect because The amount of $(176,000) results from improperly subtracting fixed costs after the calculation of income taxes.
Answer (B) is incorrect because the new doll’s effect on operating income is $(56,000).
Answer (C) is correct. The effect on net income from producing the new doll can be calculated as follows:

<table>
<thead>
<tr>
<th>Sales revenue $1,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: variable costs $(600,000)</td>
</tr>
<tr>
<td>Contribution margin $400,000</td>
</tr>
<tr>
<td>Less: fixed costs $(456,000)</td>
</tr>
<tr>
<td>Operating income $(56,000)</td>
</tr>
<tr>
<td>Add: income tax effect $16,800</td>
</tr>
<tr>
<td>Effect on net income $(39,200)</td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because the amount of $280,000 results from failing to subtract the incremental fixed costs.

Johnson Company manufactures a variety of shoes and has received a special one-time-only order directly from a wholesaler. Johnson has sufficient idle capacity to accept the special order to manufacture 15,000 pairs of sneakers at a price of $7.50 per pair. Johnson’s normal selling price is $11.50 per pair of sneakers. Variable manufacturing costs are $5.00 per pair and fixed manufacturing costs are $3.00 a pair. Johnson’s variable selling expense for its normal line of sneakers is $1.00 per pair. What would the effect on Johnson’s operating income be if the company accepted the special order?

A. Decrease by $60,000.
B. Increase by $22,500.
C. Increase by $37,500.
D. Increase by $52,500.

Answer (A) is incorrect because a $60,000 decrease results from using the difference between the selling price for the special order and the normal selling price.
Answer (B) is incorrect because a $22,500 increase results from improperly subtracting the variable selling expense.
Answer (C) is correct. The per-unit contribution margin earned from this special order will be the difference between the selling price and Johnson’s variable cost of manufacturing ($7.50 – $5.00 = $2.50). The net effect on operating income is therefore an increase of $37,500 (15,000 × $2.50).
Answer (D) is incorrect because a $52,500 increase results from using the normal selling price minus variable and fixed manufacturing costs to arrive at contribution margin.

A major difference between economic profit and accounting profit is that economic profit

A. Allows for more accurate expense accruals.
B. Minimizes the impact of accounting estimates.
C. Reduces profits by associated cost of capital.
D. Adjusts accounting profit by depreciation.

Answer (A) is incorrect because economic profit does not allow for more accurate expense accruals. The explicit costs are accrued in the same manner for both accounting and economic profit. Economic profits are more difficult to calculate because they include implicit costs, which are difficult to accrue for.
Answer (B) is incorrect because economic profit maximizes the impact of accounting estimates as the implicit costs must be estimated. These costs do not have to be estimated for accounting profit purposes.
Answer (C) is correct. Economic profits are not earned until the organization’s income exceeds not only costs as recorded in the accounting records, but the firm’s implicit costs as well. Economic profit is equal to the accounting (book) profit less the implicit costs. Therefore, economic profit reduces accounting profits by associated cost of capital.

Answer (D) is incorrect because Economic profit adjusts accounting profit by the implicit costs. Depreciation is not an implicit cost.

In the short run in perfect competition, a firm maximizes profit by producing the rate of output at which the price is equal to

A. Total cost.
B. Total variable cost.
C. Average fixed costs.
D. Marginal cost.

Answer (A) is incorrect because There would be no profit when selling price and total costs are the same.

Answer (B) is incorrect because Equating selling price to total variable costs leaves nothing to cover fixed costs.

Answer (C) is incorrect because Using only average fixed costs ignores variable costs, which increase in total with every unit produced.

Answer (D) is correct. A firm should increase production until marginal revenue equals marginal cost. In the short run, this is the same as saying a firm in perfect competition will increase production until marginal cost equals price. The result is the short-run maximization of profits. As long as selling price exceeds marginal cost, a firm should continue producing. In the short run in perfect competition, the market price equals marginal revenue because no firm can affect price by its production decisions.

A characteristic of a monopoly is that

A. A monopoly will produce when marginal revenue is equal to marginal cost.
B. There is a unique relationship between the market price and the quantity supplied.
C. In optimizing profits, a monopoly will increase its supply curve to where the demand curve becomes inelastic.
D. There are multiple prices for the product to the consumer.

Answer (A) is correct. A monopoly consists of a single firm with a unique product. Such a firm has significant price control. For profit maximization, it increases production until its marginal revenue equals its marginal cost (unless marginal revenue is less than average variable cost, which will cause the firm to shut down). When a monopoly exists, consumers will face higher prices and lower output than in perfect competition.

Answer (B) is incorrect because The monopolist is in control of the quantity supplied. Thus, the supply can be limited to produce the profit-maximizing price.

Answer (C) is incorrect because A monopolist will increase supply as long as the demand curve is inelastic. Inelasticity means that an increase in price will cause a less-than-proportionate decline in demand.

Answer (D) is incorrect because There is only one price when a monopoly exists.
Monopolistic competition is characterized by a

A. Relatively large group of sellers who produce differentiated products.
B. Relatively small group of sellers who produce differentiated products.
C. Monopolistic market where the consumer is persuaded that there is perfect competition.
D. Relatively large group of sellers who produce a homogeneous product.

- Answer (A) is correct. Monopolistic competition is characterized by a large number of firms offering differentiated products. Entry into the market is relatively easy, firms have some price control, and substantial nonprice competition exists, such as advertising.
- Answer (B) is incorrect because Monopolistic competition is characterized by a relatively large group of sellers.
- Answer (C) is incorrect because The market is not monopolistic. There are many sellers.
- Answer (D) is incorrect because Products are not homogeneous in monopolistic competition; although products may appear to be similar, they have differences in service, quality, or other attributes.

The distinguishing characteristic of oligopolistic markets is

A. A single seller of a homogeneous product with no close substitute.
B. A single seller of a heterogeneous product with no close substitute.
C. Mutual interdependence of firm pricing and output decisions.
D. Lack of entry and exit barriers in the industry.

- Answer (A) is incorrect because Oligopolies contain several firms; a single seller is characteristic of a monopoly.
- Answer (B) is incorrect because Oligopolies contain several firms; a single seller is characteristic of a monopoly.
- Answer (C) is incorrect because Oligopolies are typified by barriers to entry; that is the reason the industry has only a few firms.
- Answer (D) is correct. The oligopoly model is much less specific than the other market structures, but there are typically few firms in the industry. Thus, the decisions of rival firms do not go unnoticed. Products can be either differentiated or standardized. Prices tend to be rigid (sticky) because of the interdependence among firms. Entry is difficult because of either natural or created barriers. Price leadership is typical in oligopolistic industries. Under price leadership, price changes are announced first by a major firm. Once the industry leader has spoken, other firms in the industry match the price charged by the leader. The mutual interdependence of the firms influences both pricing and output decisions.

An industry that is oligopolistic would be best characterized by

A. One firm selling a product with no close substitutes.
B. The absence of the profit-maximizing goal.
C. Significant barriers to entry.
D. Horizontal or flat demand curves for the output of individual firms.

- Answer (A) is incorrect because An industry with a single firm is monopolistic.
- Answer (B) is incorrect because Oligopolists have the same profit-maximizing goal as other firms.
- Answer (C) is correct. An oligopolistic industry is characterized by only a few firms. Usually there are significant barriers to entry, such as high capital requirements, which prevent new firms from entering the industry. The automobile industry is an example.
Answer (D) is incorrect because the demand curve for a firm in perfect competition is horizontal. An oligopolist’s demand curve is relatively flat but may be kinked if competitors follow its price decreases but not the price increases.

[1168] The manner in which cartels set and maintain price above the competitive market price is to

A. Avoid product differentiation in order to decrease demand for the product.
B. Advertise more so market demand increases.
C. Increase costs so price must rise.
D. Require cartel members to restrict output.

Answer (A) is incorrect because oligopolists do not attempt to decrease demand for the product.
Answer (B) is incorrect because prices are maintained by restricting output.
Answer (C) is incorrect because increased costs do not necessarily result in higher prices.
Answer (D) is correct. In an oligopolistic industry, a cartel can be formed to add structure to a market with a few firms. A cartel arises when a group of oligopolistic firms join together for price-fixing purposes. This practice is illegal except in international markets. Prices are fixed at an amount greater than would occur under pure competition. Members of the cartel maintain higher prices by voluntarily restricting output.

[Fact Pattern #119]
Gator Company is selling in a purely competitive market and has the following cost data.

<table>
<thead>
<tr>
<th>Output</th>
<th>Average Fixed Cost</th>
<th>Average Variable Cost</th>
<th>Average Total Cost</th>
<th>Marginal Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$600</td>
<td>$100</td>
<td>$700</td>
<td>$100</td>
</tr>
<tr>
<td>2</td>
<td>300</td>
<td>75</td>
<td>375</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>200</td>
<td>70</td>
<td>270</td>
<td>60</td>
</tr>
<tr>
<td>4</td>
<td>150</td>
<td>73</td>
<td>223</td>
<td>82</td>
</tr>
<tr>
<td>5</td>
<td>120</td>
<td>70</td>
<td>190</td>
<td>58</td>
</tr>
<tr>
<td>6</td>
<td>100</td>
<td>90</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>7</td>
<td>86</td>
<td>105</td>
<td>191</td>
<td>197</td>
</tr>
<tr>
<td>8</td>
<td>76</td>
<td>119</td>
<td>195</td>
<td>223</td>
</tr>
<tr>
<td>9</td>
<td>67</td>
<td>138</td>
<td>205</td>
<td>285</td>
</tr>
<tr>
<td>10</td>
<td>60</td>
<td>160</td>
<td>220</td>
<td>355</td>
</tr>
</tbody>
</table>

[1169] (Refers to Fact Pattern #119)
If the market price for Gator’s product is $190, this firm should produce

A. 5 units at an economic loss of $70.
B. 6 units and break even.
C. 8 units and break even.
D. 8 units at an economic profit of $74.

Answer (A) is incorrect because the firm also will break even at 5 units.
Answer (B) is correct. A firm should increase production until marginal revenue equals marginal cost. For a firm in pure competition, marginal revenue is the same as price ($190 in this case). At 6 units, marginal revenue equals marginal cost. Given that average total cost is also $190, the firm will break even.

Answer (C) is incorrect because the firm will incur a loss at 8 units. The average total cost will be greater than price (marginal revenue).

Answer (D) is incorrect because the firm will incur a loss at 8 units. The average total cost will be greater than price (marginal revenue).

[1170] Refers to Fact Pattern #119

If the market price for Gator’s product is $290, this firm should produce

A. 7 units at an economic profit of $707.
B. 8 units at an economic profit of $760.
C. 9 units at an economic profit of $765.
D. 10 units at an economic profit of $700.

Answer (A) is incorrect because at 7 units of output, marginal costs are less than marginal revenue; a rational firm will increase production.

Answer (B) is incorrect because at 8 units of output, marginal costs are less than marginal revenue; a rational firm will increase production.

Answer (C) is correct. The firm will produce 9 units because at that level marginal revenue ($290) is closest to marginal cost ($285). At $290 per unit, revenue will be $2,610. At $205 per unit, total cost will be $1,845, leaving $765 of profit.

Answer (D) is incorrect because at 10 units of output, marginal costs are higher than marginal revenue; thus, economic profit will be less for an output of 10 units than for an output of 9 units.

[1171] Refers to Fact Pattern #119

Gator’s long-run equilibrium price will be set at

A. $110
B. $190
C. $200
D. $230

Answer (A) is incorrect because this amount is lower than the average total cost at all levels of production.

Answer (B) is correct. In a purely competitive market, the long-run equilibrium price will be at the level where marginal revenue equals marginal cost equals average total cost. Thus, equilibrium is achieved at a price of $190.

Answer (C) is incorrect because this amount is higher than the minimum average total cost.

Answer (D) is incorrect because this amount is higher than the minimum average total cost.
Mrs. Robinson is hired as a consultant to a firm that is currently competing perfectly. At the current output level the price is $10, the average variable cost is $6, the average total cost is $10, and marginal cost is $8. To maximize profits, Mrs. Robinson will recommend that the firm should

A. Decrease production.
B. Increase production.
C. Shut down.
D. Not change production.

- Answer (A) is incorrect because a firm in pure competition should increase production as long as the marginal cost is less than selling price.
- Answer (B) is correct. A firm should continue increasing production as long as marginal cost is less than selling price. Profit is maximized when marginal cost equals selling price (in pure competition, selling price is the same as marginal revenue).
- Answer (C) is incorrect because a firm should not shut down as long as selling price exceeds variable cost.
- Answer (D) is incorrect because a firm in pure competition should continue increasing production as long as the marginal cost is less than selling price.

Mr. Bojangles is hired as a consultant to a firm that is, currently, competing perfectly. At the current output level the price is $20, the average variable cost is $15, average total cost is $22, and marginal cost is $20. In order to maximize profits, Mr. Bojangles will recommend that the firm should

A. Not change output.
B. Decrease production.
C. Increase production.
D. Shut down.

- Answer (A) is correct. For profit maximization, a firm operating under pure competition should produce the level of output at which price is equal to marginal cost. Since price and marginal cost are both $20, the firm is already at its profit-maximizing position.
- Answer (B) is incorrect because a firm should not decrease output when price is at least equal to marginal cost.
- Answer (C) is incorrect because there is no incentive to increase production when marginal cost is equal to selling price.
- Answer (D) is incorrect because a firm should not shut down as long as price exceeds variable cost; any excess of price over variable cost provides a contribution toward the coverage of fixed costs.
For a firm in pure competition, the curve labeled (2) can represent any of the following except

A. Average revenue.
B. Marginal revenue.
C. Marginal cost.
D. Price.

- Answer (A) is incorrect because Average revenue for a firm in pure competition is depicted as a horizontal line.
- Answer (B) is incorrect because The perfectly elastic (horizontal) demand curve in pure competition is identical to the marginal revenue curve.
- Answer (C) is correct. As with any normal good, the demand curve for the product of an industry in perfect competition is downward sloping (if the industry as a whole expects to increase sales, it must lower price). However, since each individual firm can satisfy only a small part of the demand facing the industry, its demand curve is perfectly elastic (horizontal). The tiny segment of the industry’s demand curve occupied by each individual firm is necessarily at the point of market equilibrium. Firms in perfect competition are therefore called price takers because they must sell at the market price. Thus, the price, MR, and AR curves are all horizontal since they are identical to the perfectly elastic demand curve (Price = MR = AR).
- Answer (D) is incorrect because In pure competition, the price function is identical to the marginal revenue function and the average revenue function, and all are depicted as a horizontal line (i.e., the perfectly elastic demand curve).

As of December 31 of the year just ended, a monopolist was producing at a level where the selling price was $18, it had an average total cost of $15, an average variable cost of $12, marginal revenue of $13, and a marginal cost of $14. To maximize profits in the new year, the monopolist should

A. Not change the output level because the monopolist is currently at the profit-maximizing output level.
B. Shut down.
C. Increase production.
D. Decrease production.

- Answer (A) is incorrect because The monopolist is not at the profit-maximizing level when marginal revenue is lower than marginal cost.
- Answer (B) is incorrect because A firm should not shut down as long as marginal revenue exceeds variable cost.
Answer (C) is incorrect because the firm should not increase production when marginal cost is greater than marginal revenue.

Answer (D) is correct. A monopolist should not continue producing at the current level when marginal revenue is less than marginal cost. Decreasing output will result in increased profits.

At its current production, Abba Co., a monopolist, has a marginal cost of $18 and marginal revenue of $21. Abba will maximize profits by

A. Increasing price while keeping production constant.
B. Decreasing price and increasing production.
C. Decreasing both price and production.
D. Increasing both price and production.

Answer (A) is incorrect because increasing price will result in lower demand for a normal good.

Answer (B) is correct. A monopolist should continue increasing production until marginal revenue is equal to marginal cost. Thus, decreasing price and increasing production will enhance profitability.

Answer (C) is incorrect because decreasing price and output will reduce profits.

Answer (D) is incorrect because increasing price will reduce demand.
Josalmina Company is a pure monopolist with fixed costs of $270. The following graph and revenue and cost information are relevant to its operations:

<table>
<thead>
<tr>
<th>Unit Output</th>
<th>Marginal Price</th>
<th>Marginal Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$400</td>
<td>$160</td>
</tr>
<tr>
<td>2</td>
<td>380</td>
<td>145</td>
</tr>
<tr>
<td>3</td>
<td>360</td>
<td>130</td>
</tr>
<tr>
<td>4</td>
<td>340</td>
<td>115</td>
</tr>
<tr>
<td>5</td>
<td>320</td>
<td>130</td>
</tr>
<tr>
<td>6</td>
<td>300</td>
<td>145</td>
</tr>
<tr>
<td>7</td>
<td>280</td>
<td>160</td>
</tr>
<tr>
<td>8</td>
<td>260</td>
<td>185</td>
</tr>
<tr>
<td>9</td>
<td>240</td>
<td>210</td>
</tr>
<tr>
<td>10</td>
<td>220</td>
<td>235</td>
</tr>
<tr>
<td>11</td>
<td>200</td>
<td>260</td>
</tr>
<tr>
<td>12</td>
<td>180</td>
<td>285</td>
</tr>
</tbody>
</table>

Josalmina’s total revenue is at its maximum at what output quantity?

A. Q_1
B. Q_2
C. Q_3
D. Q_4

- Answer (A) is incorrect because Q_1 is the profit maximizing quantity for a monopolist in the long run.
- Answer (B) is correct. The demand curve is negatively sloped because a monopolist must lower prices to increase sales. Marginal revenue (MR) lies below demand and is also negatively sloped. Accordingly, P_4Q_4 is the monopolist's demand curve, and P_4Q_4 is the MR curve. Because marginal revenue, which is the change in total revenue (TR), decreases as output increases, TR increases, but at a declining rate. When MR is zero, TR is at its maximum. These conditions are met at Q_2.
- Answer (C) is incorrect because Q_3 is the quantity at which MR (P_1) for a purely competitive firm equals MC.
- Answer (D) is incorrect because At Q_4, demand is zero.
The excess of price over average total cost for Josalmina at the profit-maximizing output is

A. \( P_4 - P_3 \)
B. \( P_3 - P_2 \)
C. \( P_3 - P_1 \)
D. \( P_2 - P_1 \)

- **Answer (A)** is incorrect because the excess of \( P_4 \) over \( P_3 \) is not meaningful in this context.
- **Answer (B)** is correct. A pure monopolist maximizes profits by producing the output at which marginal revenue (MR) equals marginal cost (MC). Given that the demand curve is downward sloping for a monopolist and the MR curve is below the demand curve, \( P_4Q_4 \) must be the demand curve and \( P_3Q_2 \) must be the MR curve. LG is the MC curve, which lies below the ATC curve until MC equals ATC (at point N). Thus, KH must be the ATC curve, which is not at its lowest point where it crosses MC. Point T, the intersection of the MR and MC curves, defines the profit-maximizing quantity (\( Q_1 \)) and price (\( P_3 \), which is found with reference to point J on the demand curve, \( P_4Q_4 \)). Consequently, the excess of price over the ATC is defined by the vertical distance between point J on the demand curve and point U on the ATC curve.
- **Answer (C)** is incorrect because \( P_1 \) is established with reference to the lowest point on the MC curve (N). A monopolist is not constrained to seek the lowest average total cost.
- **Answer (D)** is incorrect because \( P_2 - P_1 \) is the difference between the monopolist’s profit-maximizing price and the lowest ATC, not a meaningful amount in this context.

Josalmina’s marginal revenue is zero at what output level?

A. 4 units.
B. 6 units.
C. 7 units.
D. 11 units.

- **Answer (A)** is incorrect because at a level of 4 units, MR is $280.
- **Answer (B)** is incorrect because at a level of 6 units, MR is $200.
- **Answer (C)** is incorrect because at a level of 7 units, MR is $160.
- **Answer (D)** is correct. Marginal revenue (MR) equals the additional total revenue from selling one additional unit. At an output of 10 units, total revenue (TR) is $2,200 (10 \times $220). At an output of 11 units, TR is also $2,200 (11 \times $200). Thus, MR is zero at the 11-unit level.

Josalmina’s profit-maximizing output level is

A. 5 units.
B. 7 units.
C. 8 units.
D. 12 units.

- **Answer (A)** is incorrect because the profit for 5 units is $650.
Answer (B) is correct. At an output of 7 units, TR is $1,960 (7 \times $280), total cost is $1,255 ($270 FC + $160 MC of unit 1 + $145 MC of unit 2 + $130 MC of unit 3 + $115 MC of unit 4 + $130 MC of unit 5 + $145 MC of unit 6 + $160 MC of unit 7), and the profit is $705 ($1,960 – $1,255).

Answer (C) is incorrect because The profit for 8 units is $640.

Answer (D) is incorrect because The loss for 12 units is $(270).

Which one of the following is the most important difference between a monopoly and a firm facing perfect competition, assuming both are unconstrained profit maximizers?

A. The competitive firm sets its price to maximize total revenue, while the monopolist maximizes the price.
B. The monopolist’s marginal revenue is less than its price, while the competitive firm’s marginal revenue equals its price.
C. The monopolist will set the output so that marginal cost equals the average cost.
D. The monopoly equilibrium price is the optimal level for society as a whole.

Answer (A) is incorrect because To encourage more sales of its product, a monopolist must lower its price. A competitive firm must accept the market price.

Answer (B) is correct. This is the most important difference. A monopolist’s marginal revenue continuously decreases as it raises its output. Past the point where MR = 0, the monopolist’s total revenue beings to decrease. For a product being sold in a purely competitive market, marginal revenue equals price.

Answer (C) is incorrect because A monopolist sets output where marginal revenue equals marginal cost. This is called price searching.

Answer (D) is incorrect because Market dominance by monopolies can lead to under-production and higher prices than would exist under conditions of competition. This is not good for society.

What is the opportunity cost of making a component part in a factory given no alternative use of the capacity?

A. The variable manufacturing cost of the component.
B. The total manufacturing cost of the component.
C. The total variable cost of the component.
D. Zero.

Answer (A) is incorrect because Opportunity cost is not an out-of-pocket cost. It is the benefit given up by not selecting the best alternative.

Answer (B) is incorrect because Opportunity cost is not an out-of-pocket cost. It is the benefit given up by not selecting the best alternative.

Answer (C) is incorrect because Opportunity cost is not an out-of-pocket cost. It is the benefit given up by not selecting the best alternative.

Answer (D) is correct. Opportunity cost is the benefit forgone by not selecting the best alternative use of scarce resources. The opportunity cost is zero when no alternative use for the productive facility is available.
[Fact Pattern #121]
Gleason Co. has two products, a frozen dessert and ready-to-bake breakfast rolls, ready for introduction. However, plant capacity is limited, and only one product can be introduced at present. Therefore, Gleason has conducted a market study, at a cost of $26,000, to determine which product will be more profitable. The results of the study follow.

<table>
<thead>
<tr>
<th>Sales of Desserts at $1.80/unit</th>
<th>Sales of Rolls at $1.20/unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>Probability</td>
</tr>
<tr>
<td>250,000</td>
<td>.30</td>
</tr>
<tr>
<td>300,000</td>
<td>.40</td>
</tr>
<tr>
<td>350,000</td>
<td>.20</td>
</tr>
<tr>
<td>400,000</td>
<td>.10</td>
</tr>
</tbody>
</table>

The costs associated with the two products have been estimated by Gleason’s cost accounting department and are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Dessert</th>
<th>Rolls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingredients per unit</td>
<td>$ .40</td>
<td>$ .25</td>
</tr>
<tr>
<td>Direct labor per unit</td>
<td>.35</td>
<td>.30</td>
</tr>
<tr>
<td>Variable overhead per unit</td>
<td>.40</td>
<td>.20</td>
</tr>
<tr>
<td>Production tooling*</td>
<td>48,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Advertising</td>
<td>30,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

*Gleason treats production tooling as a current operating expense rather than capitalizing it as a fixed asset.

[1183] Refers to Fact Pattern #121
The cost incurred by Gleason for the market study is a(n)

A. Incremental cost.
B. Prime cost.
C. Opportunity cost.
D. Sunk cost.

- Answer (A) is incorrect because An incremental cost is the additional cost of a new strategy or increased production. It is also called a differential cost.
- Answer (B) is incorrect because Prime costs are variable costs of direct material and direct labor.
- Answer (C) is incorrect because An opportunity cost is the revenue obtainable from an alternative use of a resource.
- Answer (D) is correct. A sunk cost is a previously incurred cost that is the result of a past irrevocable management decision. Nothing can be done in the future about sunk costs. The market study cost is an example.

[1184] Refers to Fact Pattern #121
Assuming that Gleason elects to produce the frozen dessert, the profit that would have been earned on the breakfast rolls is a(n)

A. Deferrable cost.
B. Sunk cost.
C. Avoidable cost.
D. Opportunity cost.

- Answer (A) is incorrect because A deferrable cost is one that can be deferred to a future period.
Answer (B) is incorrect because a sunk cost is one that cannot be reversed since it is the result of a past irrevocable decision.

Answer (C) is incorrect because an avoidable cost is an ongoing cost that may be eliminated by ceasing to perform some economic activity or segment thereof or by improving the efficiency by which such activity is accomplished.

Answer (D) is correct. An opportunity cost is the maximum return that could have been earned on the next best alternative use of a resource. In this case, the lost profit on the rolls is an opportunity cost.

The opportunity cost of making a component part in a factory with no excess capacity is the

A. Variable manufacturing cost of the component.
B. Fixed manufacturing cost of the component.
C. Cost of the production given up in order to manufacture the component.
D. Net benefit given up from the best alternative use of the capacity.

Answer (A) is incorrect because an opportunity cost is the benefit derived from the next best use of the resource, not an out-of-pocket cost.

Answer (B) is incorrect because an opportunity cost is the benefit derived from the next best use of the resource, not an out-of-pocket cost.

Answer (C) is incorrect because an opportunity cost is the benefit forgone, not the cost.

Answer (D) is correct. An opportunity cost is the maximum benefit forgone by using a scarce resource for a given purpose. It is the benefit provided by the next best use of that resource. Thus, in a factory operating at full capacity, the opportunity cost of making a component is the benefit given up by not selecting an alternative use of the plant capacity.

[Fact Pattern #122]
Condensed monthly operating income data for Korbin, Inc., for May follows:

<table>
<thead>
<tr>
<th></th>
<th>Urban Store</th>
<th>Suburban Store</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$80,000</td>
<td>$120,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>32,000</td>
<td>84,000</td>
<td>116,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$48,000</td>
<td>$36,000</td>
<td>$84,000</td>
</tr>
<tr>
<td>Direct fixed costs</td>
<td>20,000</td>
<td>40,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Store segment margin</td>
<td>$28,000</td>
<td>$(4,000)</td>
<td>$24,000</td>
</tr>
<tr>
<td>Common fixed cost</td>
<td>4,000</td>
<td>6,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$24,000</td>
<td>$(10,000)</td>
<td>$14,000</td>
</tr>
</tbody>
</table>

Additional information regarding Korbin’s operations follows:

- One-fourth of each store’s direct fixed costs would continue if either store is closed.
- Korbin allocates common fixed costs to each store on the basis of sales dollars.
- Management estimates that closing the Suburban Store would result in a 10% decrease in the Urban Store’s sales, while closing the Urban Store would not affect the Suburban Store’s sales.
- The operating results for May are representative of all months.
A decision by Korbin to close the Suburban Store would result in a monthly increase (decrease) in Korbin’s operating income of

A. $(10,800)
B. $(6,000)
C. $(1,200)
D. $4,000

- Answer (A) is correct. If the Suburban Store is closed, one-fourth of its direct fixed costs will continue. Thus, the segment margin that should be used to calculate the effect of its closing on Korbin’s operating income is $6,000 ($36,000 contribution margin – [$40,000 direct fixed costs × (1.0 – .25)]). In addition, the sales (and contribution margin) of the Urban Store will decline by 10% if the Suburban store closes. A 10% reduction in Urban’s $48,000 contribution margin will reduce income by $4,800. Accordingly, the effect of closing the Suburban Store is to decrease operating income by $10,800 ($6,000 + $4,800).
- Answer (B) is incorrect because this amount overlooks the decline in profitability at the Urban Store.
- Answer (C) is incorrect because this amount assumes that the effect on the Urban Store is a $4,800 increase in contribution margin.
- Answer (D) is incorrect because profits will decline.

Korbin is considering a promotional campaign at the Suburban Store that would not affect the Urban Store. Increasing annual promotional expense at the Suburban Store by $60,000 in order to increase this store’s sales by 10% would result in a monthly increase (decrease) in Korbin’s operating income during the year (rounded) of

A. $(5,000)
B. $(1,400)
C. $487
D. $7,000

- Answer (A) is incorrect because this amount is the monthly advertising cost.
- Answer (B) is correct. The $60,000 advertising campaign will increase direct fixed costs by $5,000 per month ($60,000 ÷ 12). Sales and contribution margin will also increase by 10%. Hence, the contribution margin for the Suburban Store will increase by $3,600 ($36,000 × 10%), and income will decline by $1,400 ($5,000 – $3,600).
- Answer (C) is incorrect because the contribution margin of the Suburban Store will increase by $3,600, which is $1,400 less than the increased advertising cost.
- Answer (D) is incorrect because this amount omits the 10% increase in variable costs from the calculation.
(Refers to Fact Pattern #122)

One-half of the Suburban Store’s dollar sales are from items sold at variable cost to attract customers to the store. Korbin is considering the deletion of these items, a move that would reduce the Suburban Store’s direct fixed expenses by 15% and result in a 20% loss of Suburban Store’s remaining sales volume. This change would not affect the Urban Store. A decision by Korbin to eliminate the items sold at cost would result in a monthly increase (decrease) in Korbin’s operating income of

A. $(5,200)
B. $(1,200)
C. $(7,200)
D. $2,000

- Answer (A) is incorrect because this figure is the new segment margin.
- Answer (B) is correct. If 50% of the Suburban Store’s sales are at variable cost, its contribution margin (sales – variable costs) must derive wholly from sales of other items. However, eliminating sales at variable cost reduces other sales by 20%. Thus, the effect is to reduce the contribution margin to $28,800 ($36,000 × .8). Moreover, fixed costs will be reduced by 15% to $34,000 ($40,000 × .85). Consequently, the new segment margin is $(5,200) ($34,000 direct fixed costs – $28,800 contribution margin), a decrease of $1,200 [$(5,200) – $(4,000)].
- Answer (C) is incorrect because this figure is the reduction in the Suburban Store’s contribution margin.
- Answer (D) is incorrect because operating income must decrease.

Power Systems, Inc., manufactures jet engines for the United States armed forces on a cost-plus basis. The cost of a particular jet engine the company manufactures is shown as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$200,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>150,000</td>
</tr>
<tr>
<td>Overhead:</td>
<td></td>
</tr>
<tr>
<td>Supervisor’s salary</td>
<td>20,000</td>
</tr>
<tr>
<td>Fringe benefits on direct labor</td>
<td>15,000</td>
</tr>
<tr>
<td>Depreciation</td>
<td>12,000</td>
</tr>
<tr>
<td>Rent</td>
<td>11,000</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>$408,000</strong></td>
</tr>
</tbody>
</table>

If production of this engine were discontinued, the production capacity would be idle, and the supervisor would be laid off. When asked to bid on the next contract for this engine, the minimum unit price that Power Systems should bid is

A. $408,000
B. $365,000
C. $397,000
D. $385,000

- Answer (A) is incorrect because depreciation and rent are allocated costs that will be incurred even if the contract is lost.
- Answer (B) is incorrect because the supervisor’s salary will have to be covered. The $20,000 salary is an avoidable cost.
- Answer (C) is incorrect because depreciation is a cost that cannot be avoided.
- Answer (D) is correct. The company will need to cover its variable costs and any other incremental costs. Thus, direct materials ($200,000), direct labor ($150,000), the supervisor’s salary ($20,000), and fringe benefits on direct labor ($15,000) are the incremental unit costs of manufacturing the engines. The breakeven price is therefore $385,000 ($200,000 + $150,000 + $20,000 + $15,000).
Hermo Company has just completed a hydro-electric plant at a cost of $21,000,000. The plant will provide the company’s power needs for the next 20 years. Hermo will use only 60% of the power output annually. At this level of capacity, Hermo’s annual operating costs will amount to $1,800,000, of which 80% are fixed. Quigley Company currently purchases its power from MP Electric at an annual cost of $1,200,000. Hermo could supply this power, thus increasing output of the plant to 90% of capacity. This would reduce the estimated life of the plant to 14 years.

If Hermo decides to supply power to Quigley, it wants to be compensated for the decrease in the life of the plant and the appropriate variable costs. Hermo has decided that the charge for the decreased life should be based on the original cost of the plant calculated on a straight-line basis. The minimum annual amount that Hermo would charge Quigley would be

A. $450,000
B. $630,000
C. $990,000
D. Some amount other than those given.

- Answer (A) is incorrect because the depreciation charge to Quigley is $450,000 ($1,500,000 × 30%).
- Answer (B) is correct. The minimum charge would include any variable costs incurred plus depreciation on a straight-line basis. Currently, variable costs are $360,000 at 60% of capacity ($1,800,000 × 20%). If Quigley purchases energy equal to an additional 30% of capacity, it can be assumed that the increase in total variable costs will be half of the variable costs for 60% of capacity, or $180,000. Also, allocating $21,000,000 over 14 years results in an annual depreciation of $1,500,000. Of this amount, 30% will relate to the capacity sold. Thus, the depreciation charge to Quigley is $450,000 ($1,500,000 × 30%). The total charge is $630,000 ($450,000 depreciation + $180,000 VC).
- Answer (C) is incorrect because the $450,000 depreciation plus $540,000 variable costs equals $990,000.
- Answer (D) is incorrect because the minimum annual charge would be $630,000.

The maximum amount Quigley would be willing to pay Hermo annually for the power is

A. $600,000
B. $1,050,000
C. $1,200,000
D. Some amount other than those given.

- Answer (A) is incorrect because this amount is not the maximum amount Quigley would be willing to pay.
- Answer (B) is incorrect because this amount is not the maximum amount Quigley would be willing to pay.
- Answer (C) is correct. Since Quigley is currently paying $1,200,000, it would not want to pay any more for the same service.
- Answer (D) is incorrect because the maximum amount Quigley would be willing to pay is $1,200,000.
JJ Motors, Inc., employs 45 sales personnel to market its line of luxury automobiles. The average car sells for $23,000, and a 6% commission is paid to the salesperson. JJ Motors is considering a change to a commission arrangement that would pay each salesperson a salary of $2,000 per month plus a commission of 2% of the sales made by that salesperson. The amount of total monthly car sales at which JJ Motors would be indifferent as to which plan to select is

A. $2,250,000
B. $3,000,000
C. $1,500,000
D. $1,250,000

- Answer (A) is correct. Given that X equals the cars sold, the indifference equation and its solution are as follows:

\[
\begin{align*}
(23,000 \times 6\%)X &= (23,000 \times 2\%)X + (45 \times 2,000) \\
920X &= 90,000 \\
X &= 97.8261 \text{ Cars}
\end{align*}
\]

At a price of $23,000 each, 97.8261 cars will sell for $2,250,000. Another approach is to determine the sales per person at which $2,000 is equal to a 4% commission. This amount is $50,000 ($2,000 \div .04) per person, or $2,250,000 (45 \times 50,000) for the entire sales force.

- Answer (B) is incorrect because at sales of $3,000,000, JJ Motors would prefer the salary plus commission plan.
- Answer (C) is incorrect because at sales of $1,500,000, JJ Motors would prefer the 6% commission plan.
- Answer (D) is incorrect because at sales of $1,250,000, JJ Motors would prefer the 6% commission plan.

[1193] ABD Realty manages five apartment complexes in a three-state area. Summary income statements for each apartment complex are shown as follows:

<table>
<thead>
<tr>
<th>ABD Realty Summary Income Statements (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
</tr>
<tr>
<td>Rental Income</td>
</tr>
<tr>
<td>Expenses</td>
</tr>
<tr>
<td>Profit</td>
</tr>
</tbody>
</table>

Included in the expenses is $1,200,000 of corporate overhead allocated to the apartment complexes based on rental income. The apartment complex(es) that ABD should consider selling is (are)

A. Apartment complexes Two, Three, Four, and Five.
B. Apartment complexes Three, Four, and Five.
C. Apartment complexes Four and Five.
D. Apartment complex Four.

- Answer (A) is incorrect because Two and Three would be profitable but for the allocation of corporate overhead.
- Answer (B) is incorrect because Three is contributing toward corporate overhead.
Answer (C) is correct. The amount of corporate overhead allocated to each complex is calculated below.

<table>
<thead>
<tr>
<th>Complex</th>
<th>Income</th>
<th>Percentage</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>$1,000</td>
<td>13.33%</td>
<td>$ 160</td>
</tr>
<tr>
<td>Two</td>
<td>1,210</td>
<td>16.13%</td>
<td>194</td>
</tr>
<tr>
<td>Three</td>
<td>2,347</td>
<td>31.29%</td>
<td>375</td>
</tr>
<tr>
<td>Four</td>
<td>1,878</td>
<td>25.04%</td>
<td>300</td>
</tr>
<tr>
<td>Five</td>
<td>1,065</td>
<td>14.21%</td>
<td>171</td>
</tr>
<tr>
<td>Total</td>
<td>$7,500</td>
<td>100.00%</td>
<td>$1,200</td>
</tr>
</tbody>
</table>

The revised profits would be as follows:

<table>
<thead>
<tr>
<th>Complex</th>
<th>Original</th>
<th>Allocation</th>
<th>Adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>$ 200</td>
<td>$160</td>
<td>$ 360</td>
</tr>
<tr>
<td>Two</td>
<td>(90)</td>
<td>194</td>
<td>104</td>
</tr>
<tr>
<td>Three</td>
<td>(253)</td>
<td>375</td>
<td>122</td>
</tr>
<tr>
<td>Four</td>
<td>(522)</td>
<td>300</td>
<td>(222)</td>
</tr>
<tr>
<td>Five</td>
<td>(235)</td>
<td>171</td>
<td>(64)</td>
</tr>
</tbody>
</table>

After eliminating the allocated costs from the income statement, Four and Five still have losses.

Answer (D) is incorrect because Five should also be eliminated.

Following are the operating results of the two segments of Parklin Corporation.

<table>
<thead>
<tr>
<th></th>
<th>Segment A</th>
<th>Segment B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$10,000</td>
<td>$15,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>Variable costs of goods sold</td>
<td>(4,000)</td>
<td>(8,500)</td>
<td>(12,500)</td>
</tr>
<tr>
<td>Fixed costs of goods sold</td>
<td>(1,500)</td>
<td>(2,500)</td>
<td>(4,000)</td>
</tr>
<tr>
<td>Gross margin</td>
<td>$ 4,500</td>
<td>$ 4,000</td>
<td>$ 8,500</td>
</tr>
<tr>
<td>Variable selling and administrative</td>
<td>(2,000)</td>
<td>(3,000)</td>
<td>(5,000)</td>
</tr>
<tr>
<td>Fixed selling and administrative</td>
<td>(1,500)</td>
<td>(1,500)</td>
<td>(3,000)</td>
</tr>
<tr>
<td>Operating income (loss)</td>
<td>$ 1,000</td>
<td>$(500)</td>
<td>$(500)</td>
</tr>
</tbody>
</table>

Fixed costs of goods sold are allocated to each segment based on the number of employees. Fixed selling and administrative expenses are allocated equally. If Segment B is eliminated, $1,500 of fixed costs of goods sold would be eliminated. Assuming Segment B is closed, the effect on operating income would be a(n)

A. Increase of $500.
B. Increase of $2,000.
C. Decrease of $2,000.
D. Decrease of $2,500.

Answer (A) is incorrect because a $500 increase results from simply adding back Segment B’s operating loss.
Answer (B) is incorrect because a $2,000 increase results from reversing the effects of deleting the elements of Segment B.
Answer (C) is correct. The effect of closing Segment B on Parklin’s operating income can be calculated as follows:

Sales eliminated $(15,000)
Variable costs of goods sold eliminated 8,500
Fixed costs of goods sold eliminated 1,500
Variable S&A expenses eliminated 3,000
Net effect $ (2,000)

Answer (D) is incorrect because a $2,500 decrease results from removing all the relevant elements of Segment B and removing the operating loss, in effect double-counting.

A company wants to open a new store in one of two nearby shopping malls. In Mall A, the rent will be $250,000 per year. In Mall B, the rent will be 4% of gross revenues. Assuming that revenues and all other elements under consideration are the same for both malls, at what level of revenues will the company be indifferent between the two malls?

A. $1,000,000
B. $4,000,000
C. $6,250,000
D. $12,500,000

Answer (A) is incorrect because at revenues below $6,250,000, Mall B is preferable.
Answer (B) is incorrect because assuming a 40% contribution margin ratio results in $750,000.
Answer (C) is correct. The level of indifference is calculated by setting the equation for the first mall (a flat $250,000) equal to the equation for the second mall. Solving for that equation involves dividing $250,000 by 4%, resulting in an indifference level of revenues of $6,250,000.
Answer (D) is incorrect because at any level of revenues over $6,250,000, Mall A is preferable.

[Fact Pattern #124]
A company wants to open a new store in one of three nearby shopping malls. In Mall A, the rent will be $300,000 per year. In Mall B, the rent will be 4% of gross revenues. In Mall C, the rent will be $150,000 per year plus 3% of gross revenues. Assume that revenues and all other elements under consideration are the same for all three malls.

Which mall should the company choose if revenues are expected to be $6,000,000 per year?

A. Mall A
B. Mall B
C. Mall C
D. The company will be indifferent between two of the choices

Answer (A) is incorrect because Mall B’s rent is $240,000, Mall A’s rent is $300,000, and Mall C’s rent is $330,000.
Answer (B) is correct. The answer depends on the expected level of revenues. If the company expects revenues to be $6,000,000 per year, the calculation is as follows:

Mall A: $300,000
Mall B: $6,000,000 × 4% = $240,000
Mall C: $6,000,000 × 3% = $180,000 + $150,000 = $330,000
Thus, Mall B is preferable.

Answer (C) is incorrect because Mall B’s rent is $240,000, Mall A’s rent is $300,000, and Mall C’s rent is $330,000.
Answer (D) is incorrect because Mall B’s rent is $240,000, Mall A’s rent is $300,000, and Mall C’s rent is $330,000.

If the company expects revenues to be $10,000,000 per year, which mall should be chosen?

A. Mall A.
B. Mall B.
C. Mall C.
D. The company will be indifferent between two of the choices.

Answer (A) is correct. If the company expects revenues to be $10,000,000 per year, the calculation is as follows:

Mall A: $300,000
Mall B: $10,000,000 × 4% = $400,000
Mall C: $10,000,000 × 3% = $300,000 + $150,000 = $450,000
Thus, Mall A is preferable.

Answer (B) is incorrect because Mall A’s rent is $300,000, Mall B’s rent is $400,000, and Mall C’s rent is $450,000.
Answer (C) is incorrect because Mall A’s rent is $300,000, Mall B’s rent is $400,000, and Mall C’s rent is $450,000.
Answer (D) is incorrect because Mall A’s rent is $300,000, Mall B’s rent is $400,000, and Mall C’s rent is $450,000.

What is the maximum level of revenues at which Mall C will be the most desirable of the three options?

A. $149,999
B. $5,000,000
C. $15,000,000
D. Mall C will never be the most desirable choice.

Answer (A) is incorrect because Mall C will never be the lowest cost choice.
Answer (B) is incorrect because Mall C will never be the lowest cost choice.
Answer (C) is incorrect because Mall C will never be the lowest cost choice.
Answer (D) is correct. Mall C will never be the optimal choice because it will be less desirable than Mall B as long as 1% of gross revenue is less than $150,000, that is, until revenues reach $15,000,000 [$150,000 minimum ÷ (4% – 3%)]. However, at any level of revenues greater than $7,500,000 ($300,000 ÷ 4%), Mall A (a flat $300,000 rental) will be more desirable than either of the other choices. Thus, Mall C will never be the most desirable.
Raymund, Inc., a bearings manufacturer, has the capacity to produce 7,000 bearings per month. Raymund’s income statement for an average month is as follows:

<table>
<thead>
<tr>
<th>Sales (5,000 units at $20 per unit)</th>
<th>$100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable manufacturing costs</td>
<td>$50,000</td>
</tr>
<tr>
<td>Variable selling costs</td>
<td>15,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$ 35,000</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>16,000</td>
</tr>
<tr>
<td>Fixed selling costs</td>
<td>4,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 15,000</td>
</tr>
</tbody>
</table>

Raymund has an effective income tax rate of 40%. The company is considering two mutually exclusive options, replacing a portion of its labor intensive production process with a highly automated process, or filling a one-time special order.

If Raymund retools its production process, the company’s fixed manufacturing costs would be increased by $30,000 per month and its variable costs would be reduced by $5 per unit. If Raymund selects this option, the company’s monthly operating income would be

A. $5,000  
B. $10,000  
C. $30,000  
D. $40,000

- Answer (A) is incorrect because the change in operating income is $5,000.
- Answer (B) is correct. The effect on Raymund’s operating income can be calculated using the incremental method as follows:

  Current operating income $15,000  
  Changes:  
  Variable mfg. costs (5,000 × $5) 25,000  
  Fixed mfg. costs (30,000)  
  Operating income after retooling $10,000

- Answer (C) is incorrect because the amount of $30,000 results from changing fixed costs to $30,000 instead of increasing them by $30,000.
- Answer (D) is incorrect because the amount of $40,000 results from failing to account for the change in fixed costs.
Refrigerator Company manufactures ice-makers for installation in refrigerators. The costs per unit, for 20,000 units of ice-makers, are as follows.

- Direct materials: $7
- Direct labor: $12
- Variable overhead: $5
- Fixed overhead: $10

Total costs: $34

Cool Compartments, Inc., has offered to sell 20,000 ice-makers to Refrigerator Company for $28 per unit. If Refrigerator accepts Cool Compartments' offer, two alternatives are available for the ice-maker manufacturing plant: the plant can be idled or it can be retrooled to produce water filtration units.

If Refrigerator idles its existing plant, fixed overhead amounting to $6 per unit could be eliminated. The total relevant costs associated with the manufacture of ice-makers amount to

- A. $480,000
- B. $560,000
- C. $600,000
- D. $680,000

Answer (A) is incorrect because the amount of $480,000 results from improperly netting the purchase price of the ice-makers with the $80,000 of remaining fixed costs.

Answer (B) is incorrect because the amount of $560,000 is only the purchase price of the ice-makers.

Answer (C) is correct. Relevant costs are those that vary depending on the option chosen. Thus, $4 per unit of fixed overhead (20,000 units $4 = $80,000) will be incurred regardless of the option chosen. This amount is irrelevant to the decision. The costs eliminated by buying ice-makers are the relevant costs of making the ice-makers. They equal $24 per unit ($7 + $12 + $5) of variable costs (20,000 units $24 = $480,000) and $6 per unit of fixed costs (20,000 units $6 = $120,000), a total of $600,000.

Answer (D) is incorrect because the amount of $680,000 results from adding the purchase price of the ice-makers and the saved costs of $120,000.

Sunshine Corporation is considering the purchase of a new machine for $800,000. The machine is capable of producing 1.6 million units of product over its useful life. The manufacturer’s engineering specifications state that the machine-related cost of producing each unit of product should be $.50. Sunshine’s total anticipated demand over the asset’s useful life is 1.2 million units. The average cost of materials and labor for each unit is $.40. In considering whether to buy the new machine, would you recommend that Sunshine use the manufacturer’s engineering specification of machine-related unit production cost?

- A. No, the machine-related cost of producing each unit is $2.00.
- B. No, the machine-related cost of producing each unit is $.67.
- C. No, the machine-related cost of producing each unit is $.90.
- D. Yes, the machine-related cost of producing each unit is $.50.

Answer (A) is incorrect because the amount of $2.00 results from improperly using machine capacity rather than anticipated usage, and reversing the order of division.
• Answer (B) is correct. Dividing the cost of the machine ($800,000) by the anticipated lifetime production (1,200,000 units) results in a machine-related per-unit cost of $.67.
• Answer (C) is incorrect because the amount of $.90 includes non-machine-related costs.
• Answer (D) is incorrect because the cost of the machine must be allocated to the number of units actually expected to be produced, not the number the machine is capable of.

[1202] Jack Blaze wants to rent store space in a new shopping mall for the 3-month holiday shopping season. Blaze believes he has a new product available that has the potential for good sales. The product can be obtained on consignment at the cost of $20 per unit, and he expects to sell the item for $100 per unit. Due to other business ventures, Blaze’s risk tolerance is low. He recognizes that, as the product is entirely new, there is an element of risk. The mall management has offered Blaze three rental options: (1) a fixed fee of $8,000 per month, (2) a fixed fee of $3,990 per month plus 10% of Blaze’s revenue, or (3) 30% of Blaze’s revenues. Which one of the following actions would you recommend to Jack Blaze?

A. Choose the first option no matter what Blaze expects the revenues to be.
B. Choose the second option no matter what Blaze expects the revenues to be.
C. Choose the second option only if Blaze expects revenues to exceed $5,700.
D. Choose the third option no matter what Blaze expects the revenues to be.

• Answer (A) is incorrect because when the venture is risky and the risk for tolerance is low, fixed costs are to be avoided.
• Answer (B) is incorrect because when the venture is risky and the risk for tolerance is low, fixed costs are to be avoided.
• Answer (C) is incorrect because when the venture is risky and the risk for tolerance is low, fixed costs are to be avoided.
• Answer (D) is correct. Blaze recognizes that trying to sell the new product is risky. For this reason, fixed costs are to be avoided. If sales are low, relying on variable costs will keep total costs down.

[Fact Pattern #127]
Current business segment operations for Whitman, a mass retailer, are presented below.

<table>
<thead>
<tr>
<th></th>
<th>Merchandise</th>
<th>Automotive</th>
<th>Restaurant</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$500,000</td>
<td>$400,000</td>
<td>$100,000</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>300,000</td>
<td>200,000</td>
<td>70,000</td>
<td>570,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>100,000</td>
<td>100,000</td>
<td>50,000</td>
<td>250,000</td>
</tr>
<tr>
<td>Operating income (loss)</td>
<td>$100,000</td>
<td>$100,000</td>
<td>($20,000)</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

Management is contemplating the discontinuance of the Restaurant segment since “it is losing money.” If this segment is discontinued, $30,000 of its fixed costs will be eliminated. In addition, Merchandise and Automotive sales will decrease 5% from their current levels.

[1203] (Refers to Fact Pattern #127) What will Whitman’s total contribution margin be if the Restaurant segment is discontinued?

A. $160,000
B. $220,000
C. $367,650
D. $380,000
Answer (A) is incorrect because the amount of $160,000 would be the new operating income, not the contribution margin.

Answer (B) is incorrect because the amount of $220,000 would be the new total fixed costs, not the contribution margin.

Answer (C) is incorrect because the amount of $367,650 results from applying the current contribution margin ratio to the new level of sales.

Answer (D) is correct. The incremental approach can be used to calculate the change in Whitman’s contribution margin as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current contribution margin</td>
<td>$430,000</td>
</tr>
<tr>
<td>Less: lost restaurant sales</td>
<td>(100,000)</td>
</tr>
<tr>
<td>Add: restaurant variable costs</td>
<td>70,000</td>
</tr>
<tr>
<td>Less: lost merchandise sales</td>
<td>(25,000)</td>
</tr>
<tr>
<td>Add: merchandise variable costs</td>
<td>15,000</td>
</tr>
<tr>
<td>Less: lost automotive sales</td>
<td>(20,000)</td>
</tr>
<tr>
<td>Add: automotive variable costs</td>
<td>10,000</td>
</tr>
<tr>
<td>New contribution margin</td>
<td>$380,000</td>
</tr>
</tbody>
</table>

[Refers to Fact Pattern #127]

When considering the decision, Whitman’s controller advised that one of the financial aspects Whitman should review is contribution margin. Which one of the following options reflects the current contribution margin ratios for each of Whitman’s business segments?

<table>
<thead>
<tr>
<th></th>
<th>Retailing</th>
<th>Automotive</th>
<th>Restaurant</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>60%</td>
<td>50%</td>
<td>30%</td>
</tr>
<tr>
<td>B.</td>
<td>60%</td>
<td>50%</td>
<td>70%</td>
</tr>
<tr>
<td>C.</td>
<td>40%</td>
<td>50%</td>
<td>70%</td>
</tr>
<tr>
<td>D.</td>
<td>40%</td>
<td>50%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Answer (A) is incorrect because the variable cost ratio for Retailing is 60%.

Answer (B) is incorrect because the variable cost ratios, not the contribution margin ratios, are 60%:50%:70%.

Answer (C) is incorrect because the variable cost ratio for the Restaurant is 70%.

Answer (D) is correct. Whitman’s segments’ contribution margin ratios can be derived by first calculating the variable cost ratios (Retailing: $300,000 ÷ $500,000 = 60%, Automotive: $200,000 ÷ $400,000 = 50%, Restaurant: $70,000 ÷ $100,000 = 70%), then subtracting each from 1 (Retailing: (1 – 60% = 40%), Automotive: (1 – 50% = 50%), Restaurant: (1 – 70% = 30%)).
The Furniture Company currently has three divisions: Maple, Oak, and Cherry. The oak furniture line does not seem to be doing well, and the president of the company is considering dropping this line. If it is dropped, the revenues associated with the Oak Division will be lost and the related variable costs saved. Also, 50% of the fixed costs allocated to the oak furniture line would be eliminated. The income statements, by divisions, are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Maple</th>
<th>Oak</th>
<th>Cherry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$55,000</td>
<td>$85,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>40,000</td>
<td>72,000</td>
<td>82,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$15,000</td>
<td>$13,000</td>
<td>$18,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>10,000</td>
<td>14,000</td>
<td>10,200</td>
</tr>
<tr>
<td>Operating profit (loss)</td>
<td>$5,000</td>
<td>$(1,000)</td>
<td>$7,800</td>
</tr>
</tbody>
</table>

Which one of the following options should be recommended to the president of the company?

A. Continue operating the Oak Division as discontinuance would result in a total operating loss of $1,200.
B. Continue operating the Oak Division as discontinuance would result in a $6,000 decline in operating profits.
C. Discontinue the Oak Division which would result in a $1,000 increase in operating profits.
D. Discontinue the Oak Division which would result in a $7,000 increase in operating profits.

- Answer (A) is incorrect because a total operating loss of $1,200 results from failing to take the saved portion of fixed costs into account.
- Answer (B) is correct. The incremental changes to The Furniture Company’s operating profit from dropping the oak line can be calculated as follows:

  |                      |
  | Lost revenues        | $(85,000) |
  | Saved variable costs | 72,000    |
  | Saved fixed costs    | 7,000     |
  | Change in operating profit | $(6,000) |

- Answer (C) is incorrect because a $1,000 increase in operating profits results from failing to recognize that only a portion of the oak line’s fixed costs will be saved.
- Answer (D) is incorrect because a $7,000 increase in operating profits results from treating only the portion of fixed costs saved as the incremental difference in operating profit.

Sudden economic changes have forced AutoFacsimilie Co. to alter its business strategy. The company is considering eliminating product lines, laying off production workers, reducing advertising, and closing one of its factories. In taking these actions, which one of the following costs should be considered sunk costs?

A. Production workers’ wages, severance, and advertising.
B. Utility costs at the closed factory and real estate taxes.
C. Research and development costs of eliminated product lines.
D. The costs of selling or demolishing the factory.

- Answer (A) is incorrect because relevant costs must be made in the future and differ among the possible alternative courses of action. By definition, a sunk cost is not relevant. Product workers’ wages, severance, and advertising are all costs that are to be made in the future and can differ among alternative courses of action. Accordingly, these costs are relevant to the decision at hand and are not “sunk.”
Answer (B) is incorrect because Relevant costs must be made in the future and differ among the possible alternative courses of action. By definition, a sunk cost is not relevant. Utility costs at the closed factory and real estate taxes are both costs that are to be made in the future and can differ among alternative courses of action. Accordingly, these costs are relevant the decision at hand and are not “sunk.”

Answer (C) is correct. Costs that have already been incurred or to which the organization is committed are called sunk costs. These costs have no bearing on any future decisions. The research and development costs of eliminated product lines have already been incurred and cannot be reversed as a result of eliminating the product lines. Therefore, this answer choice correctly represents sunk costs.

Answer (D) is incorrect because Relevant costs must be made in the future and differ among the possible alternative courses of action. By definition, a sunk cost is not relevant. The cost of selling or demolishing the factory is a cost that is to be made in the future and can differ among alternative courses of action. Accordingly, this cost is relevant the decision at hand and is not “sunk.”

Joe Cooper owns and operates an ice cream truck that he drives through residential neighborhoods to sell five different treats to the area’s children. On average, Cooper sells 100 of each type of treat per day for the 120 days per year when the weather is warm enough to generate sales. Four of his products are profitable, but the other, Creamy Delight, indicates a loss as follows:

<table>
<thead>
<tr>
<th>Selling price/unit</th>
<th>$1.75</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of each treat</td>
<td>$0.80</td>
</tr>
<tr>
<td>Truck operating costs/unit</td>
<td>$0.37</td>
</tr>
<tr>
<td>Joe’s salary/unit</td>
<td>$0.60</td>
</tr>
<tr>
<td>Administrative costs/unit</td>
<td>$0.08</td>
</tr>
<tr>
<td>Loss/unit</td>
<td>$(0.10)</td>
</tr>
</tbody>
</table>

If Cooper cannot raise his selling price, he should

A. Discontinue the sales of Creamy Delight to increase his profits by $1,200.
B. Discontinue the sales of Creamy Delight to increase his profits by $240.
C. Continue to sell Creamy Delight to avoid a decrease in profit of $6,960.
D. Continue to sell Creamy Delight to avoid a decrease in profit of $11,400.

Answer (A) is incorrect because Discontinuing Creamy Delight would decrease profits by $11,400.
Answer (B) is incorrect because Discontinuing Creamy Delight would decrease profits by $11,400.
Answer (C) is incorrect because The only relevant values in this analysis are the selling price and the cost of each treat, or a profit of $11,400 per year \([(1.75 - 0.80) \times 100 \times 120]\).
Answer (D) is correct. The truck operating cost/unit, the salary/unit, and the administrative cost/unit are all unavoidable costs. If Joe were to discontinue Creamy Delight, Joe would still incur these costs with no Creamy Delight profit to cover them. The only relevant values in this analysis are the selling price and the cost of each treat, or a profit of $11,400 per year \([(1.75 - 0.80) \times 100 \times 120]\). Joe should continue to sell Creamy Delight or else he will lose $11,400 per year of profit used to cover the other constant fixed costs.
The Sommers Company manufactures a variety of industrial valves. Currently, the company is operating at about 70% capacity and is earning a satisfactory return on investment. Management has been approached by Glasgow Industries Ltd. of Scotland with an offer to buy 120,000 units of a pressure valve. Glasgow manufactures a valve that is almost identical to Sommers’ pressure valve; however, a fire in Glasgow Industries’ valve plant has shut down its manufacturing operations. Glasgow needs the 120,000 valves over the next 4 months to meet commitments to its regular customers; the company is prepared to pay $19 each for the valves, FOB shipping point. Sommers’ product cost, based on current attainable standards, for the pressure valve is as follows:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>$5.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>6.00</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>9.00</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>$20.00</strong></td>
</tr>
</tbody>
</table>

Manufacturing overhead is applied to production at the rate of $18 per standard direct labor hour. This overhead rate is made up of the following components:

| Variable factory overhead | $6.00 |
| Fixed factory overhead-direct | 8.00 |
| Fixed factory overhead-allocated | 4.00 |
| **Applied manufacturing overhead rate** | **$18.00** |

In determining selling prices, Sommers adds a 40% markup to product cost. This provides a $28 suggested selling price for the pressure valve. The Marketing Department, however, has set the current selling price at $27 to maintain market share. Production management believes that it can handle the Glasgow Industries order without disrupting its scheduled production. The order would, however, require additional fixed factory overhead of $12,000 per month in the form of supervision and clerical costs. If management accepts the order, 30,000 pressure valves will be manufactured and shipped to Glasgow Industries each month for the next 4 months. Shipments will be made in weekly consignments, FOB shipping point.

[1208](Refers to Fact Pattern #128)

How many additional direct labor hours would be required each month to fill the Glasgow order?

A. 10,000  
B. 15,000  
C. 30,000  
D. 120,000

- Answer (A) is incorrect because this number of hours is found by dividing the direct labor per pressure valve by the manufacturing overhead rate to find the standard direct labor hour per finished valve.
- Answer (B) is correct. The manufacturing overhead rate is $18 per standard direct labor hour and the standard product cost includes $9 of manufacturing overhead per pressure valve. Accordingly, the standard direct labor hour per finished valve is 1/2 hour ($9 / $18). Therefore, 30,000 units per month would require 15,000 direct labor hours.
- Answer (C) is incorrect because the number of pressure valves produced in a month is 30,000.
- Answer (D) is incorrect because the total number of valves ordered is 120,000.
What is the incremental profit (loss) before tax associated with the Glasgow order?

A. ($168,000)
B. ($120,000)
C. $552,000
D. $600,000

- Answer (A) is incorrect because a $168,000 loss is found by using a variable overhead rate of $9 per unit.
- Answer (B) is incorrect because a $120,000 loss is found by using a variable overhead rate of $9 per unit.
- Answer (C) is correct. The incremental revenue is found by taking the $19 per unit price and multiplying it by the 120,000 units ordered. Then, the variable costs per unit are multiplied by 120,000 to get a $600,000 cost for materials ($5 × 120,000), a $720,000 cost for labor ($6 × 120,000), and a $360,000 cost for overhead ($3 × 120,000). The variable costs are added to the additional fixed overhead cost of $48,000 (4 months × $12,000) to get a total incremental cost of $1,728,000. Then, the total cost is subtracted from the revenue to get an incremental profit before tax of $552,000 ($2,280,000 – $1,728,000).
- Answer (D) is incorrect because a $600,000 profit is found by not subtracting the fixed overhead.

What is the minimum unit price that Sommers could accept without reducing net income?

A. $14
B. $14.40
C. $20
D. $20.40

- Answer (A) is incorrect because not adding the fixed cost results in $14.
- Answer (B) is correct. The minimum unit price without reducing net income must cover variable costs plus the additional fixed cost. Therefore, the three variable costs of $5.00 for direct materials, $6.00 for direct labor, and $3.00 for variable overhead are added to the additional fixed cost per unit $.40 ($48,000 ÷ 120,000). The total is $14.40.
- Answer (C) is incorrect because using a variable overhead rate of $9 and ignoring fixed overhead results in $20.
- Answer (D) is incorrect because using a variable overhead rate of $9 results in $20.40.
Kator Co. is a manufacturer of industrial components. One of their products that is used as a subcomponent in auto manufacturing is KB-96. This product has the following financial structure per unit:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$150</td>
</tr>
<tr>
<td>Direct materials</td>
<td>$20</td>
</tr>
<tr>
<td>Direct labor</td>
<td>15</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>12</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>30</td>
</tr>
<tr>
<td>Shipping and handling</td>
<td>3</td>
</tr>
<tr>
<td>Fixed selling and administrative</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>$90</strong></td>
</tr>
</tbody>
</table>

Kator Co. has received a special, one-time order for 1,000 KB-96 parts.

[1211] Refers to Fact Pattern #129

Kator Co. has received a special, one-time order for 1,000 KB-96 parts. Assuming Kator has excess capacity, the minimum price that is acceptable for this one-time special order is in excess of

A. $47  
B. $50  
C. $60  
D. $77

- Answer (A) is incorrect because the amount of $47 ignores the shipping and handling costs.
- Answer (B) is correct. A company must cover the incremental costs of a special order when it has excess capacity. The incremental costs for product KB-96 are $50 ($20 direct materials + $15 direct labor + $12 variable overhead + $3 shipping and handling). The fixed costs will not change as a result of the special order, so they are not relevant. Thus, any price in excess of $50 per unit is acceptable.
- Answer (C) is incorrect because the amount of $60 includes fixed selling and administrative costs.
- Answer (D) is incorrect because the amount of $77 includes fixed manufacturing overhead but omits shipping and handling costs.

[1212] Refers to Fact Pattern #129

Kator Co. has received a special, one-time order for 1,000 KB-96 parts. Assume that Kator is operating at full capacity and that the contribution margin of the output that would be displaced by the special order is $10,000. Using the original data, the minimum price that is acceptable for this one-time special order is in excess of

A. $60  
B. $70  
C. $87  
D. $100

- Answer (A) is correct. Given no excess capacity, the price must cover the incremental costs. The incremental costs for KB-96 equal $50 ($20 direct materials + $15 direct labor + $12 variable overhead + $3 shipping and handling). Opportunity cost is the benefit of the next best alternative use of scarce resources. Because acceptance of the special order would cause the company to forgo a contribution margin of $10,000, that amount must be reflected in the price. Hence, the minimum unit price is $60 [$50 unit incremental cost + ($10,000 lost CM ÷ 1,000 units)].
Answer (B) is incorrect because this amount includes fixed selling and administrative costs.
Answer (C) is incorrect because this amount includes fixed manufacturing overhead but omits shipping and handling costs.
Answer (D) is incorrect because this amount is based on full absorption cost.

[Fact Pattern #130]

Panyer Co. is a producer of a tank component. This product, J-5, has the following selling price and costs per unit:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$300</td>
</tr>
<tr>
<td>Direct materials</td>
<td>125</td>
</tr>
<tr>
<td>Direct labor</td>
<td>25</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>50</td>
</tr>
<tr>
<td>Shipping and handling</td>
<td>5</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>15</td>
</tr>
<tr>
<td>Fixed selling and administrative</td>
<td>10</td>
</tr>
<tr>
<td>Total costs</td>
<td>$230</td>
</tr>
</tbody>
</table>

[1213] (Refers to Fact Pattern #130)

Panyer has recently received a special, one-time order for 2,000 units of J-5. Panyer currently has enough excess capacity for this order. What should be the minimum price charged by Panyer?

A. $155
B. $205
C. $230
D. $300

- Answer (A) is incorrect because ignoring the variable manufacturing overhead from total variable costs results in $155.
- Answer (B) is correct. With the assumption that idle capacity is sufficient to manufacture 2,000 extra units, the goal is to find a minimum price that will not affect the price or quantity of other units sold. This minimum price is equal to the sum of the variable costs, $205.
- Answer (C) is incorrect because this amount is total costs, not total variable costs.
- Answer (D) is incorrect because the normal selling price is $300.

[1214] (Refers to Fact Pattern #130)

Panyer has again received a special, one-time offer for 2,000 units of J-5. Panyer is now operating at full capacity, 10,000 units, at a total cost of $2,300,000. To produce this order would cause a 20% increase in fixed costs. What is the minimum price that is acceptable for this one-time, special order?

A. $205
B. $260
C. $230
D. $300

- Answer (A) is incorrect because this amount is the minimum price at less than full capacity.
Answer (B) is incorrect because Using fixed costs at 120% of capacity as $360,000 \((12,000 \text{ units} \times 25 \text{ fixed cost}) \times 1.2\) results in $260. The fixed costs should be calculated based on a 20% increase over the full capacity cost of $250,000 \((10,000 \text{ units} \times 25 \text{ fixed cost})\).

Answer (C) is correct. To determine the minimum price per unit, while at full capacity, the differential costs must be found. The total cost of producing 12,000 units is $2,760,000 \([12,000 \text{ units} \times 205 \text{ variable cost}] + [10,000 \text{ units} \times 25 \text{ fixed cost}] \times 1.2\] \). Thus, the total differential cost is $460,000 \($2,760,000 - $2,300,000\), and the unit differential cost is $230 \($460,000 \div 2,000 \text{ units}\).

Answer (D) is incorrect because The price for regular orders is $300.

**[Fact Pattern #131]**

Pontotoc Industries manufactures a product that is used as a subcomponent by other manufacturers. It has the following price and cost structure:

<table>
<thead>
<tr>
<th>Selling price</th>
<th>$300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td>$40</td>
</tr>
<tr>
<td>Direct labor</td>
<td>30</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>24</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>60</td>
</tr>
<tr>
<td>Variable selling</td>
<td>6</td>
</tr>
<tr>
<td>Fixed selling and administrative</td>
<td>20 (180)</td>
</tr>
<tr>
<td>Operating margin</td>
<td>$120</td>
</tr>
</tbody>
</table>

**[1215]**[Refers to Fact Pattern #131]

Pontotoc received a special, one-time order for 1,000 of the above parts. Assuming Pontotoc has excess capacity, the minimum unit price for this special, one-time order is in excess of

A. $180  
B. $120  
C. $100  
D. $160

- Answer (A) is incorrect because Given excess capacity, the total absorption cost of $180 per unit is not relevant.  
- Answer (B) is incorrect because This amount is the normal operating margin, not a cost.  
- Answer (C) is correct. In a special order situation, a company with excess capacity has a $0 opportunity cost of filling the special order. Accordingly, it should be willing to sell the product at a price that exceeds its incremental costs. The incremental (relevant) costs for Pontotoc equal the variable costs of $100 \($40 \text{ direct materials} + $30 \text{ direct labor} + $24 \text{ variable overhead} + $6 \text{ variable selling costs}\) \). Thus, if the selling price is in excess of $100, the company should be willing to accept the order.  
- Answer (D) is incorrect because This amount includes the fixed manufacturing overhead, an irrelevant cost.
Pontotoc received a special, one-time order for 1,000 units of its product. However, Pontotoc has an alternative use for this capacity that will result in a contribution of $20,000. The minimum unit price for this special, one-time order is in excess of

A. $200  
B. $180  
C. $140  
D. $120

- Answer (A) is incorrect because the amount of $200 is based on a $20 increment over the total cost on an absorption costing basis.  
- Answer (B) is incorrect because the amount of $180 is the total absorption cost.  
- Answer (C) is incorrect because the amount of $140 is based on a $20 increment over the operating margin.  
- Answer (D) is **correct**. Incremental (relevant) costs include the variable costs of $100 ($40 direct materials + $30 direct labor + $24 variable overhead + $6 variable selling costs). Furthermore, if the company does not have idle capacity, the unit price must cover the opportunity costs as well as the variable costs. Given that the alternative use will generate a $20,000 contribution, the 1,000 special-order units will have to generate at least $20 per unit ($20,000 ÷ 1,000 units) above their variable costs, a total of $120 per unit.

Production of a special order will increase gross profit when the additional revenue from the special order is greater than

A. The direct materials and labor costs in producing the order.  
B. The fixed costs incurred in producing the order.  
C. The indirect costs of producing the order.  
D. The marginal cost of producing the order.

- Answer (A) is incorrect because indirect variable costs of producing a special order, such as shipping expenses, should also be considered.  
- Answer (B) is incorrect because fixed costs should not increase as a result of producing the special order.  
- Answer (C) is incorrect because direct labor and materials costs associated with producing a special order must be considered.  
- Answer (D) is **correct**. Gross profit will increase if the incremental or marginal cost of producing the order is less than the marginal revenue. Marginal cost equals the relevant variable costs assuming fixed costs are not affected by the special order.

When considering a special order that will enable a company to make use of currently idle capacity, which of the following costs is irrelevant?

A. Materials.  
B. Depreciation.  
C. Direct labor.  
D. Variable overhead.

- Answer (A) is incorrect because materials are relevant to a decision whether to take a special order.  
- Answer (B) is **correct**. Because depreciation will be expensed whether or not the company accepts the special order, it is irrelevant to the decision. Only the variable costs are relevant.  
- Answer (C) is incorrect because direct labor is relevant to a decision whether to take a special order.
Answer (D) is incorrect because Variable overhead is relevant to a decision whether to take a special order.

[1219]Which of the following cost allocation methods is used to determine the lowest price that can be quoted for a special order that will use idle capacity within a production area?

A. Job order.
B. Process.
C. Variable.
D. Standard.

Answer (A) is incorrect because Job order is a cost accumulation procedure that may treat fixed costs as product costs.
Answer (B) is incorrect because The process method is a cost accumulation procedure that may treat fixed costs as product costs.
Answer (C) is correct. If idle capacity exists, the lowest feasible price for a special order is one covering the variable cost. Variable costing considers fixed cost to be a period cost, not a product cost. Fixed costs are not relevant to short-term inventory costing with idle capacity because the fixed costs will be incurred whether or not any production occurs. Any additional revenue in excess of the variable costs will decrease losses or increase profits.
Answer (D) is incorrect because Standard costing attempts to measure deviations from expected costs.

[1220]When only differential manufacturing costs are taken into account for special-order pricing, an essential assumption is that

A. Manufacturing fixed and variable costs are linear.
B. Selling and administrative fixed and variable costs are linear.
C. Acceptance of the order will not affect regular sales.
D. Acceptance of the order will not cause unit selling and administrative variable costs to increase.

Answer (A) is incorrect because The differential analysis of a special order considers total marginal costs. Thus, unit variable costs and total fixed costs need not be constant, and any changes need not be in direct proportion to the measure of activity.
Answer (B) is incorrect because The assumption is that selling and administrative costs are not relevant.
Answer (C) is correct. Granting a lower-than-normal price for a special order has potential ramifications for regular sales because other customers may demand the same price. Thus, the decision to consider differential manufacturing costs only should be based on a determination that all other costs are not relevant, that is, that these other costs do not vary with the option chosen.
Answer (D) is incorrect because The assumption is that acceptance of the order will not cause total selling and administrative costs to change.
Clay Co. has considerable excess manufacturing capacity. A special job order’s cost sheet includes the following applied manufacturing overhead costs:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs</td>
<td>$21,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>33,000</td>
</tr>
</tbody>
</table>

The fixed costs include a normal $3,700 allocation for in-house design costs, although no in-house design will be done. Instead, the job will require the use of external designers costing $7,750. What is the total amount to be included in the calculation to determine the minimum acceptable price for the job?

A. $36,700  
B. $40,750  
C. $54,000  
D. $58,050

- Answer (A) is incorrect because Variable costs plus the in-house design costs equals $36,700.
- Answer (B) is correct. Given excess capacity, the company presumably will not incur opportunity costs if it accepts the special order. Assuming also that fixed costs will be unaffected, the incremental cost of the order (the minimum acceptable price) will be $40,750 ($33,000 VC + $7,750 cost of external design).
- Answer (C) is incorrect because The fixed costs plus the variable costs equals $54,000.
- Answer (D) is incorrect because The fixed costs, plus the variable costs, minus the in-house design costs, plus the external design costs equals $58,050.

**Fact Pattern #132**

A mail-order confectioner sells fine candy in one-pound boxes. It has the capacity to produce 600,000 boxes annually, but forecasts that it will produce and sell only 500,000 boxes in the coming year. The costs to manufacture and distribute the candy are detailed below. The organization has invested capital of $6,750,000.

<table>
<thead>
<tr>
<th>Variable costs per pound:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>$4.85</td>
<td></td>
</tr>
<tr>
<td>Packaging</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Distribution</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7.00</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual fixed costs:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing overhead</td>
<td>$810,000</td>
<td></td>
</tr>
<tr>
<td>Marketing and distribution</td>
<td>270,000</td>
<td></td>
</tr>
</tbody>
</table>
The confectioner has been asked by a retailer to submit a bid for a special order of 40,000 one-pound boxes of candy; this is a one-time order that will not be repeated. While the candy would be almost identical, the candy ingredients would be $0.45 less. The total distribution costs for the entire order would be $32,000. Special setup costs required by this order would amount to $60,000. There would be no other changes in costs, rates, or amounts. The minimum selling price per one-pound box that the confectioner would bid on this special order would be

A. $7.05  
B. $8.85  
C. $9.05  
D. $9.55

- **Answer (A) is correct.** The minimum selling price equals the incremental costs of the special order (variable manufacturing costs, variable packaging costs, distribution costs, and setup costs) divided by the units ordered. The fixed costs do not change because the manufacturer has excess capacity. Total variable manufacturing costs are $190,000 \(40,000 \times (\$4.85 - \$0.45 + \$0.35)\), distribution costs are $32,000, and setup costs are $60,000. Thus, the minimum unit price is $7.05 \(\frac{\$190,000 + \$32,000 + \$60,000}{40,000}\).
- **Answer (B) is incorrect because Adding the additional distribution costs to the original distribution costs \([\$1.80 + \$0.80]\) equals $8.85.
- **Answer (C) is incorrect because Adding an amount for the fixed costs to the relevant costs results in $9.05.
- **Answer (D) is incorrect because Adding an amount for the target return on investment to the relevant costs results in $9.55.

The selling price per pound that the confectioner should charge for a one-pound box of candy to obtain a 20% rate of return on invested capital is

A. $9.70  
B. $11.05  
C. $11.50  
D. $11.86

- **Answer (A) is incorrect because This amount omits all of the fixed costs.
- **Answer (B) is incorrect because The amount of $11.05 bases the cost per unit on 600,000 units.
- **Answer (C) is incorrect because Using a fixed cost per unit based on 600,000 units results in $11.50.
- **Answer (D) is correct.** The company expects to incur variable costs of $3,500,000 (500,000 lbs. × $7) and fixed costs of $1,080,000 ($810,000 + $270,000). To earn a 20% return on invested capital ($6,750,000 × 20% = $1,350,000), the company must charge a price of $11.86 \(\frac{\$3,500,000 + \$1,080,000 + \$1,350,000}{500,000}\).
A manufacturer has been approached by a new customer who wants to place a one-time order for a component similar to one that the manufacturer makes for another customer. Existing sales will not be affected by acceptance of this order. The manufacturer has a policy of setting its targeted selling price at 60% over full manufacturing cost. The manufacturing costs and the targeted selling price for the existing product are presented as follows.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$2.30</td>
</tr>
<tr>
<td>Direct labor</td>
<td>3.60</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>2.70</td>
</tr>
<tr>
<td>(applied at 75% of direct labor cost)</td>
<td></td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>5.40</td>
</tr>
<tr>
<td>(applied at 150% of direct labor cost)</td>
<td></td>
</tr>
<tr>
<td>Total manufacturing cost</td>
<td>$14.00</td>
</tr>
<tr>
<td>Markup (60% of full manufacturing cost)</td>
<td>8.40</td>
</tr>
<tr>
<td>Targeted selling price</td>
<td>$22.40</td>
</tr>
</tbody>
</table>

The manufacturer has excess capacity to produce the quantity of the component desired by the new customer. The direct materials used in the component for the new customer would cost the manufacturer $0.25 less than the component currently being made. The variable selling expenses (packaging and shipping) would be the same, or $0.90 per unit. Under these circumstances, the minimum unit price at which the manufacturer would accept the special order is one exceeding

- A. $8.35
- B. $9.25
- C. $14.00
- D. $14.80

- Answer (A) is incorrect because this amount does not consider the variable selling expenses.
- Answer (B) is correct. Because the manufacturer has excess capacity and existing sales will be unaffected, the minimum price the manufacturer should be willing to accept is anything above the total variable cost of the unit ($2.05 + $3.60 + $2.70 + $0.90 = $9.25), an amount that includes the variable manufacturing cost and the variable selling expenses. The fixed costs are not relevant.
- Answer (C) is incorrect because the total manufacturing cost is $14.00, which includes the fixed manufacturing overhead and direct materials at $2.30 per unit, but not the variable selling expenses. Additional fixed manufacturing overhead costs will not be incurred because the manufacturer is below full capacity. The fixed manufacturing overhead is a sunk cost that is not relevant to this decision.
- Answer (D) is incorrect because this amount does not consider that the manufacturer is below full capacity and that the customer is placing a one-time order. Under these circumstances, the manufacturer would not use its targeted selling price formula.
McCann Company can manufacture one of two special orders with their existing capacity. Special Order A is for 100,000 units and Special Order B is for 200,000 units. Cost and revenue data per unit are as follows:

<table>
<thead>
<tr>
<th>Per Unit</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price</td>
<td>.7000</td>
<td>.4500</td>
</tr>
<tr>
<td>Direct materials</td>
<td>.4550</td>
<td>.2775</td>
</tr>
<tr>
<td>Direct labor:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>.1100</td>
<td>.0993</td>
</tr>
<tr>
<td>Fixed</td>
<td>.0300</td>
<td>.0089</td>
</tr>
<tr>
<td>Manufacturing overhead:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>.0430</td>
<td>.0330</td>
</tr>
<tr>
<td>Fixed</td>
<td>.0370</td>
<td>.0523</td>
</tr>
<tr>
<td>Variable marketing costs, already incurred to obtain the order</td>
<td>.0900</td>
<td>.0912</td>
</tr>
<tr>
<td>Fixed marketing and administrative costs</td>
<td>.0950</td>
<td>.0878</td>
</tr>
</tbody>
</table>

Based on the above information, which one of the following statements correctly identifies the effect on pretax profit if the optimal decision is made?

A. $200 increase if Special Order A is taken.
B. $9,200 increase if Special Order A is taken.
C. $13,430 increase if Special Order A is taken.
D. $8,040 increase if Special Order B is taken.

- Answer (A) is incorrect because a $200 increase from Special Order A results from improperly including the variable marketing costs already incurred (a sunk cost).
- Answer (B) is correct. The effect on pretax profit of producing the two special orders can be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Order A</th>
<th>Order B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$ 0.4550</td>
<td>$ 0.2775</td>
</tr>
<tr>
<td>Variable direct labor</td>
<td>0.1100</td>
<td>0.0993</td>
</tr>
<tr>
<td>Variable OH</td>
<td>0.0430</td>
<td>0.0330</td>
</tr>
<tr>
<td>Total differential costs</td>
<td>$ 0.6080</td>
<td>$ 0.4098</td>
</tr>
<tr>
<td>Selling price</td>
<td>0.7000</td>
<td>0.4500</td>
</tr>
<tr>
<td>UCM</td>
<td>$ 0.0920</td>
<td>$ 0.0402</td>
</tr>
<tr>
<td>Times: order size</td>
<td>× 100,000</td>
<td>× 200,000</td>
</tr>
<tr>
<td>Effect on pretax profit</td>
<td>$ 9,200</td>
<td>$ 8,040</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because the profit increase would be $9,200.
- Answer (D) is incorrect because while an $8,040 increase would result from accepting Special Order B, it is not the optimal decision. Accepting Special Order A would be more profitable.
Gardener Company currently is using its full capacity of 25,000 machine hours to manufacture product XR-2000. LJB Corporation placed an order with Gardener for the manufacture of 1,000 units of KT-6500. LJB would normally manufacture this component. However, due to a fire at its plant, LJB needs to purchase these units to continue manufacturing other products. This is a one-time special order. The following reflects unit cost data and selling prices.

<table>
<thead>
<tr>
<th></th>
<th>KT-6500</th>
<th>XR-2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>$27</td>
<td>$24</td>
</tr>
<tr>
<td>Direct labor</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>48</td>
<td>40</td>
</tr>
<tr>
<td>Variable selling &amp; administrative</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Fixed selling &amp; administrative</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Normal selling price</td>
<td>$125</td>
<td>$105</td>
</tr>
<tr>
<td>Machine hours required</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

What is the minimum unit price that Gardener should charge LJB to manufacture 1,000 units of KT-6500?

A. $93.00  
B. $96.50  
C. $110.00  
D. $125.00  

- Answer (A) is incorrect because The cost of a single unit of XR-2000 is $93.00.
- Answer (B) is correct. Gardener would have to give up 3,000 machine hours to fill LJB’s special order for KT-6500 (1,000 units × 3 hours per unit). If Gardener devotes those hours to the special order, it would give up 750 units of XR-2000 (3,000 hours ÷ 4 units per hour). The per-unit cost of XR-2000 is $43 ($24 + $10 + $5 + $4), so the per-unit margin is $62 ($105 – $43). The margin that Gardener would forego if it accepts the order is therefore $46,500 (750 units × $62 margin per unit). Dividing the $46,500 of lost profits on the existing product by the 1,000 units of the special order produces an opportunity cost of $46.50 per unit. Adding this to the $50 of variable cost ($27 + $12 + $6 + $5) produces a minimum price of $96.50.
- Answer (C) is incorrect because The cost of a single unit of KT-2500 is $110.00.
- Answer (D) is incorrect because The selling price of XR-2000 is $125.00.

The loss of a key customer has temporarily caused Bedford Machining to have some excess manufacturing capacity. Bedford is considering the acceptance of a special order, one that involves Bedford’s most popular product. Consider the following types of costs.

I. Variable costs of the product  
II. Fixed costs of the product  
III. Direct fixed costs associated with the order  
IV. Opportunity cost of the temporarily idle capacity

Which one of the following combinations of cost types should be considered in the special order acceptance decision?

A. I and II  
B. I and IV  
C. II and III  
D. I, III, and IV.  

- Answer (A) is incorrect because Fixed costs of the product are not relevant.  
- Answer (B) is incorrect because Direct fixed costs of the order are relevant also.  
- Answer (C) is incorrect because Fixed costs of the product are not relevant.
Answer (D) is correct. Fixed costs of the product do not vary whether the special order is accepted or not, making them irrelevant. All the other costs will change if the order is accepted and are therefore relevant. The opportunity cost of the temporarily idle facility, if there are any, should also be considered.

[Fact Pattern #133]
Raymund, Inc., a bearings manufacturer, has the capacity to produce 7,000 bearings per month. Raymund’s income statement for an average month is as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (5,000 units at $20 per unit)</td>
<td>$100,000</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$50,000</td>
</tr>
<tr>
<td>Variable selling costs</td>
<td>15,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$35,000</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>$16,000</td>
</tr>
<tr>
<td>Fixed selling costs</td>
<td>4,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$15,000</td>
</tr>
</tbody>
</table>

Raymund has an effective income tax rate of 40%. The company is considering two mutually exclusive options, replacing a portion of its labor intensive production process with a highly automated process, or filling a one-time special order.

[1228](Refers to Fact Pattern #133)
Raymund currently sells its only product to a single customer. Raymund has received a one-time-only order for 2,000 units from another buyer. Sale of the special order items will not require any additional selling effort. In negotiating a price for the special order, Raymund should set the minimum per unit selling price at

- A. $10
- B. $13
- C. $17
- D. $18

Answer (A) is correct. Raymund has excess capacity, so no new fixed costs have to be taken on to accept the special order. Also, no additional selling effort will be required. Thus, the only costs that must be covered by the special order are the variable manufacturing costs ($50,000 ÷ 5,000 units = $10 per unit).

Answer (B) is incorrect because the amount of $13 results from covering all variable costs rather than just variable manufacturing costs.

Answer (C) is incorrect because the amount of $17 results from covering all costs rather than just variable manufacturing costs.

Answer (D) is incorrect because the amount of $18 would result in a profit.
Basic Computer Company (BCC) sells its micro-computers using bid pricing. It develops bids on a full cost basis. Full cost includes estimated material, labor, variable overheads, fixed manufacturing overheads, and reasonable incremental computer assembly administrative costs, plus a 10% return on full cost.

BCC’s current cost structure, based on its normal production levels, is $500 for materials per computer and $20 per labor hour. BCC’s variable manufacturing overhead is $2 per labor hour, fixed manufacturing overhead is $3 per labor hour, and incremental administrative costs are $8 per computer assembled.

BCC has received a request from the School Board for 500 computers. Assembly and testing of each computer requires 12 labor hours. The company’s management expects heavy competition in bidding for this job. BCC believes bids in excess of $925 per computer are not likely to be considered. As this is a very large order for BCC, and could lead to other educational institution orders, management is extremely interested in submitting a bid that would win the job, but at a price high enough so that current net income will not be unfavorably impacted. Management believes this order can be absorbed within its current manufacturing facility. Which one of the following bid prices should be recommended to BCC’s management?

A. $764.00  
B. $772.00  
C. $849.20  
D. $888.80

- Answer (A) is incorrect because The amount of $764.00 results from failing to include the incremental administrative costs.  
- Answer (B) is correct. The price that BCC should bid can be calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials (given)</td>
<td>$500.00</td>
</tr>
<tr>
<td>Direct labor (12 hours × $20)</td>
<td>240.00</td>
</tr>
<tr>
<td>Variable overhead (12 hours × $2)</td>
<td>24.00</td>
</tr>
<tr>
<td>Incremental administrative (given)</td>
<td>8.00</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>$772.00</strong></td>
</tr>
</tbody>
</table>

Fixed overhead is not included because management believes the current plant is capable of handling this order; thus, there are no incremental fixed costs. The 10% return cannot be included because BCC wants to be competitive and it is not a true fixed cost.

- Answer (C) is incorrect because The amount of $849.20 results from improperly including the 10% return.  
- Answer (D) is incorrect because The amount of $888.80 results from improperly including fixed overhead and the 10% return.
BCC has received a request from a research lab for 200 computers. Assembly and testing of each computer will require 17 labor hours. BCC believes bids in excess of $1,050 per computer are not likely to be considered. Using the full-cost criteria and desired level of return, which one of the following prices should be recommended to BCC’s management for bidding purposes?

A. $874.00  
B. $882.00  
C. $961.40  
D. $1,026.30

Answer (A) is incorrect because The amount of $874.00 results from failing to include fixed overhead, the incremental administrative cost, and the 10% required return.

Answer (B) is incorrect because The amount of $882.00 results from failing to include fixed overhead and the 10% required return.

Answer (C) is incorrect because The amount of $961.40 results from failing to include fixed overhead and the incremental administrative cost.

Answer (D) is correct. The price that BCC should bid can be calculated as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials (given)</td>
<td>$500.00</td>
</tr>
<tr>
<td>Direct labor (17 hours × $20)</td>
<td>340.00</td>
</tr>
<tr>
<td>Variable overhead (17 hours × $2)</td>
<td>34.00</td>
</tr>
<tr>
<td>Fixed overhead (17 hours × $3)</td>
<td>51.00</td>
</tr>
<tr>
<td>Incremental administrative (given)</td>
<td>8.00</td>
</tr>
<tr>
<td><strong>Base cost</strong></td>
<td><strong>$933.00</strong></td>
</tr>
<tr>
<td>Required return (10%)</td>
<td>93.30</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>$1,026.30</strong></td>
</tr>
</tbody>
</table>

Fixed overhead and the 10% required return are included because BCC is using the full-cost criteria on this bid.

Green Corporation builds custom-designed machinery. A review of selected data and the company’s pricing policies revealed the following.

- A 10% commission is paid on all sales orders.
- Variable and fixed factory overheads total 40% and 20%, respectively, of direct labor.
- Corporate administrative costs amount to 10% of direct labor.
- When bidding on jobs, Green adds a 25% markup to the total of all factory and administrative costs to cover income taxes and produce a profit.
- The firm’s income tax rate is 40%.

The company expects to operate at a maximum of 80% of practical capacity.

Green recently received an invitation to bid on the manufacture of some custom machinery for Kennendale, Inc. For this project, Green’s production accountants estimate the material and labor costs will be $66,000 and $120,000, respectively. Accordingly, Green submitted a bid to Kennendale in the amount of $375,000. Feeling Green’s bid was too high, Kennendale countered with a price of $280,000. Which one of the following options should be recommended to Green’s management?

A. Accept the counteroffer because the order will increase operating income.  
B. Accept the counteroffer even though the order will decrease operating income.  
C. Reject the counteroffer even though the order will increase operating income.  
D. Reject the counteroffer because the order will decrease operating income.
Answer (A) is correct. Based on the information given, the bid price of $375,000 was apparently calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials (given)</td>
<td>$66,000</td>
</tr>
<tr>
<td>Direct labor (given)</td>
<td>$120,000</td>
</tr>
<tr>
<td>Sales commission (10%)</td>
<td>$37,500</td>
</tr>
<tr>
<td>Variable overhead (40% of DL)</td>
<td>$48,000</td>
</tr>
<tr>
<td>Fixed overhead (20% of DL)</td>
<td>$24,000</td>
</tr>
<tr>
<td>Corporate administrative (10% of DL)</td>
<td>$12,000</td>
</tr>
<tr>
<td>Profit (25% of fact costs)</td>
<td>$67,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$375,000</strong></td>
</tr>
</tbody>
</table>

The counteroffer is $95,000 less than the bid price. The fixed costs and profit included in the original bid totaled $103,500 ($24,000 + $12,000 + $67,500). Therefore, the company would be better off by $8,500 if it accepts the counteroffer. In other words, the revenue from the counteroffer ($280,000) exceeds the $271,500 incremental costs of the project ($66,000 + $120,000 + $37,500 + $48,000) by $8,500.

Answer (B) is incorrect because the counteroffer should be accepted because it will result in increased operating income.

Answer (C) is incorrect because the counteroffer should be accepted because it will result in increased operating income.

Answer (D) is incorrect because the counteroffer should be accepted because it will result in increased operating income.

Listed below are a company’s monthly unit costs to manufacture and market a particular product.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$2.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$2.40</td>
</tr>
<tr>
<td>Variable indirect</td>
<td>$1.60</td>
</tr>
<tr>
<td>Fixed indirect</td>
<td>$1.00</td>
</tr>
<tr>
<td>Marketing variable</td>
<td>$2.50</td>
</tr>
<tr>
<td>Marketing fixed</td>
<td>$1.50</td>
</tr>
</tbody>
</table>

The company must decide to continue making the product or buy it from an outside supplier. The supplier has offered to make the product at the same level of quality that the company can make it. Fixed marketing costs would be unaffected, but variable marketing costs would be reduced by 30% if the company were to accept the proposal. What is the maximum amount per unit that the company can pay the supplier without decreasing operating income?

A. $8.50  
B. $6.75  
C. $7.75  
D. $5.25

Answer (A) is incorrect because the amount of $8.50 assumes that all variable marketing costs are avoidable.

Answer (B) is correct. The key to this question is, what costs will the company avoid if it buys from the outside supplier? It will no longer incur the $2.00 of direct materials, nor the $2.40 of direct labor, nor the $1.60 of variable overhead, nor $0.75 ($2.50 × 30%) of the variable marketing costs (regardless of whether the company makes or buys, it will still incur 70% of the variable marketing costs). The firm will therefore avoid costs of $6.75 ($2.00 + $2.40 + $1.60 + $0.75). Hence, it will at least break even by paying no more than $6.75.

Answer (C) is incorrect because the amount of $7.75 assumes that fixed manufacturing costs of $1 are avoidable.

Answer (D) is incorrect because the amount of $5.25 results from subtracting the savings in marketing costs from the manufacturing savings.
In a make-versus-buy decision, the relevant costs include variable manufacturing costs as well as

A. Factory management costs.
B. General office costs.
C. Avoidable fixed costs.
D. Depreciation costs.

- Answer (A) is incorrect because Factory management costs are unlikely to differ regardless of which decision is selected.
- Answer (B) is incorrect because General office costs are unlikely to differ regardless of which decision is selected.
- Answer (C) is correct. The relevant costs in a make-versus-buy decision are those that differ between the two decision choices. These costs include any variable costs plus any avoidable fixed costs. Avoidable fixed costs will not be incurred if the “buy” decision is selected.
- Answer (D) is incorrect because Depreciation costs are unlikely to differ regardless of which decision is selected.

Laurel Corporation has its own cafeteria with the following annual costs:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>$100,000</td>
</tr>
<tr>
<td>Labor</td>
<td>75,000</td>
</tr>
<tr>
<td>Overhead</td>
<td>110,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$285,000</strong></td>
</tr>
</tbody>
</table>

The overhead is 40% fixed. Of the fixed overhead, $25,000 is the salary of the cafeteria supervisor. The remainder of the fixed overhead has been allocated from total company overhead. Assuming the cafeteria supervisor will remain and Laurel will continue to pay his/her salary, the maximum cost Laurel will be willing to pay an outside firm to service the cafeteria is

A. $285,000
B. $175,000
C. $219,000
D. $241,000

- Answer (A) is incorrect because The amount of $285,000 is greater than the avoidable cost of operating the cafeteria.
- Answer (B) is incorrect because The company can pay more than $175,000. Its overhead costs are avoidable.
- Answer (C) is incorrect because The company can pay more than $219,000.
- Answer (D) is correct. Given that overhead is 40% fixed, $66,000 ($110,000 × 60%) is variable, and $44,000 is fixed. Of the latter amount, $25,000 is attributable to the supervisor’s salary. The $19,000 remainder is allocated from total company overhead and is unavoidable. Assuming the company will continue to pay the supervisor’s salary if an outside firm services the cafeteria, the total fixed overhead is not an avoidable (incremental) cost. Thus, the total avoidable cost of the cafeteria’s operation is $241,000 ($100,000 food + $75,000 labor + $66,000 VOH). This amount is the savings from hiring an outside firm. Accordingly, it is also the maximum that Laurel should be willing to pay the outside firm.

A company’s approach to an insourcing vs. outsourcing decision

A. Depends on whether the company is operating at or below normal volume.
B. Involves an analysis of avoidable costs.
C. Should use absorption (full) costing.
D. Should use activity-based costing.
• Answer (A) is incorrect because Whether operations are at normal volume is less important than the amount of idle capacity. The company is less likely to buy if it has sufficient unused capacity.
• Answer (B) is correct. Available resources should be used as efficiently as possible before outsourcing. If the total relevant costs of production are less than the cost to buy the item, it should be produced in-house. The relevant costs are those that can be avoided.
• Answer (C) is incorrect because Total costs (absorption costing) are not as important as relevant costs.
• Answer (D) is incorrect because Activity-based costing is used to allocate fixed overhead. Fixed overhead is not relevant in an insourcing vs. outsourcing decision unless it is avoidable.

[1236] Costs relevant to an insourcing vs. outsourcing decision include variable manufacturing costs as well as

A. Avoidable fixed costs.
B. Factory depreciation.
C. Property taxes.
D. Factory management costs.

• Answer (A) is correct. Relevant costs are anticipated costs that will vary among the choices available. If two courses of action share some costs, those costs are not relevant because they will be incurred regardless of the decision made. Relevant costs include fixed costs that could be avoided if the items were purchased from an outsider.
• Answer (B) is incorrect because Depreciation should not be considered unless it can be avoided.
• Answer (C) is incorrect because Property taxes are not affected by the decision and are therefore not relevant unless the decision to buy leads to sale of the property.
• Answer (D) is incorrect because Factory management costs are not affected by the decision and are therefore not relevant unless the decision to buy reduces the number of factory managers.

[1237] In an insourcing vs. outsourcing situation, which of the following qualitative factors is usually considered?

A. Special technology.
B. Skilled labor.
C. Special materials requirements.
D. All of the answers are correct.

• Answer (A) is incorrect because Special technology, skilled labor, and special materials requirements are all considered in an insourcing vs. outsourcing situation.
• Answer (B) is incorrect because Special technology, skilled labor, and special materials requirements are all considered in an insourcing vs. outsourcing situation.
• Answer (C) is incorrect because Special technology, skilled labor, and special materials requirements are all considered in an insourcing vs. outsourcing situation.
• Answer (D) is correct. Special technology may be available either within or outside the firm that relates to the particular product. The firm may possess necessary skilled labor or the supplier may. Special materials requirements may also affect the decision process because one supplier may have monopolized a key component. Another factor to be considered is that assurance of quality control is often a reason for making rather than buying.
In an insourcing vs. outsourcing decision, the decision process favors the use of total costs rather than unit costs. The reason is that

A. Unit cost may be calculated based on different volumes.
B. Irrelevant costs may be included in the unit amounts.
C. Allocated costs may be included in the unit amounts.
D. All of the answers are correct.

- Answer (A) is incorrect because Reasons favoring total costs are that unit cost may be calculated based on different volumes and that allocated costs and irrelevant costs may be included in the unit amounts.
- Answer (B) is incorrect because Reasons favoring total costs are that unit cost may be calculated based on different volumes and that allocated costs and irrelevant costs may be included in the unit amounts.
- Answer (C) is incorrect because Reasons favoring total costs are that unit cost may be calculated based on different volumes and that allocated costs and irrelevant costs may be included in the unit amounts.
- Answer (D) is correct. Unit costs should be used with extreme care. In each situation, they may be calculated based on a different volume level from that anticipated, so comparability may be lost. Irrelevant costs included in the unit cost should be disregarded; only relevant costs should be included in the analysis. Allocated costs should also be ignored, and only the relevant costs that will change with the option chosen should be considered.

Which of the following qualitative factors favors the buy choice in an insourcing vs. outsourcing decision?

A. Maintaining a long-run relationship with suppliers is desirable.
B. Quality control is critical.
C. Idle capacity is available.
D. All of the answers are correct.

- Answer (A) is correct. The maintenance of long-run relationships with suppliers may become paramount in a make-or-buy decision. Abandoning long-run supplier relationships may cause difficulty in obtaining needed parts when terminated suppliers find it advantageous not to supply parts in the future.
- Answer (B) is incorrect because If quality is important, one can ordinarily control it better in one’s own plant.
- Answer (C) is incorrect because The availability of idle capacity more likely favors the decision to make.
- Answer (D) is incorrect because The importance of quality control and the availability of idle capacity are qualitative factors favoring the make choice in an insourcing vs. outsourcing.
The ABC Company manufactures components for use in producing one of its finished products. When 12,000 units are produced, the full cost per unit is $35, separated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$ 5</td>
</tr>
<tr>
<td>Direct labor</td>
<td>15</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>10</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>5</td>
</tr>
</tbody>
</table>

The XYZ Company has offered to sell 12,000 components to ABC for $37 each. If ABC accepts the offer, some of the facilities currently being used to manufacture the components can be rented as warehouse space for $40,000. However, $3 of the fixed overhead currently applied to each component would have to be covered by ABC’s other products. What is the differential cost to the ABC Company of purchasing the components from the XYZ Company?

A. $8,000  
B. $20,000  
C. $24,000  
D. $44,000  

- Answer (A) is incorrect because this figure assumes that $3 of fixed overhead is avoidable.
- Answer (B) is correct. Differential (incremental) cost is the difference in total cost between two decisions. The relevant costs do not include unavoidable costs, such as the $3 of fixed overhead. It would cost ABC an additional $20,000 to purchase, rather than manufacture, the components.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price (12,000 × $37)</td>
<td>$444,000</td>
</tr>
<tr>
<td>Minus: rental income</td>
<td>(40,000)</td>
</tr>
<tr>
<td>Net cost to purchase</td>
<td>$404,000</td>
</tr>
<tr>
<td>Cost to manufacture (12,000 × $32)</td>
<td>(384,000)</td>
</tr>
<tr>
<td>Cost differential</td>
<td>$ 20,000</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because this figure compares the full cost of manufacturing with cost to purchase.
- Answer (D) is incorrect because this figure ignores the opportunity cost.
A company needs special gears. The machinery to make the gears can be rented for $100,000 for 1 year, but the company can buy the gears and avoid the rental cost. Because the demand for the gears may be high (0.6 probability) or low (0.4 probability) and contribution margins vary, the company prepared the following decision tree:

Which of the following statements is true?

A. The expected value of making is $20,000.
B. The expected value of buying is $70,000.
C. Making the gears is the best choice.
D. Buying the gears is the best choice.

- Answer (A) is incorrect because the expected value to make the gears is $70,000 \([0.6 \times 200,000] + [0.4 \times 125,000] - 100,000\) machine rental.
- Answer (B) is correct. The expected value of buying the gears is

\[
\begin{align*}
0.6 \times 100,000 &= 60,000 \\
0.4 \times 25,000 &= 10,000 \\
\frac{70,000}{70,000}
\end{align*}
\]

- Answer (C) is incorrect because making the gears gives the same expected value as buying the gears, although the projected CMs for the make decision are higher than those for the buy decision.
- Answer (D) is incorrect because making the gears gives the same expected value as buying the gears, although the projected CMs for the make decision are higher than those for the buy decision.

American Coat Company estimates that 60,000 special zippers will be used in the manufacture of men’s jackets during the next year. Reese Zipper Company has quoted a price of $0.60 per zipper. American would prefer to purchase 5,000 units per month, but Reese is unable to guarantee this delivery schedule. To ensure availability of these zippers, American is considering the purchase of all 60,000 units at the beginning of the year. Assuming American can invest cash at 8%, the company’s opportunity cost of purchasing the 60,000 units at the beginning of the year is

A. $1,320
B. $1,440
C. $2,640
D. $2,880
Answer (A) is correct. The cost of 60,000 zippers is $36,000 (60,000 × $.60). The monthly cost is $3,000 (5,000 × $.60). The company would like to purchase the items monthly, so it will invest at least $3,000 in January. Accordingly, the zippers to be used in January will be purchased at the first of the year even if no special purchase is made. Thus, the incremental advance purchase is only $33,000. Because the alternative arrangement involves a constant monthly expenditure of $3,000, the incremental investment declines by that amount each month. The result is that the average incremental investment for the year is $16,500 ($33,000 ÷ 2), and the opportunity cost of purchasing 60,000 units at the beginning of the year is $1,320 ($16,500 × 8%).

Answer (B) is incorrect because The amount of $1,440 is 8% of $18,000 ($36,000 ÷ 2).

Answer (C) is incorrect because The amount of $2,640 equals 8% of $33,000.

Answer (D) is incorrect because The amount of $2,880 equals 8% of $36,000.

Randall Corporation is a table manufacturing company that has the following cost structure for producing table tops.

<table>
<thead>
<tr>
<th>Unit Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$23.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>12.00</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>10.00</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>17.00</td>
</tr>
<tr>
<td>Variable administrative costs</td>
<td>2.00</td>
</tr>
<tr>
<td>Fixed administrative costs</td>
<td>3.00</td>
</tr>
<tr>
<td>Total unit costs</td>
<td>$67.00</td>
</tr>
</tbody>
</table>

Recently, Randall Corporation received an offer from Blurr Corporation to supply the table tops to Randall. Randall is considering buying the table tops from Blurr instead of manufacturing them internally. Which one of the following statements is correct?

A. Randall should reject Blurr’s offer if it is less than $47.00 and Randall has excess manufacturing capacity.

B. Randall should accept Blurr’s offer if it is $50.00 or more and Randall has excess manufacturing capacity.

C. Randall should accept Blurr’s offer if it is less than $47.00 and Randall has excess manufacturing capacity.

D. Randall should reject Blurr’s offer if it is $50.00 or more.

Answer (A) is incorrect because Given excess capacity, any price less than $47 is advantageous.

Answer (B) is incorrect because Given excess capacity, any price greater than $47 is uneconomical.

Answer (C) is correct. The total unit cost includes $20 of fixed costs ($17 + $3) that is not avoidable if the units are purchased. Moreover, the company has excess capacity. The opportunity cost of making the table tops is zero because no production will be displaced. Consequently, the relevant unit cost of making the table tops is the $47 unit variable cost, and the supplier’s price must be less to justify the buy decision.

Answer (D) is incorrect because The decision to reject a price of $50 or more may depend on whether the firm must displace other production to make the table tops.
Stewart Industries has been producing two bearings, components B12 and B18, for use in production.

<table>
<thead>
<tr>
<th></th>
<th>B12</th>
<th>B18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine hours required per unit</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Standard cost per unit:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct material</td>
<td>$ 2.25</td>
<td>$ 3.75</td>
</tr>
<tr>
<td>Direct labor</td>
<td>4.00</td>
<td>4.50</td>
</tr>
<tr>
<td>Manufacturing overhead:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable (See Note 1)</td>
<td>2.00</td>
<td>2.25</td>
</tr>
<tr>
<td>Fixed (See Note 2)</td>
<td>3.75</td>
<td>4.50</td>
</tr>
<tr>
<td></td>
<td>$12.00</td>
<td>$15.00</td>
</tr>
</tbody>
</table>

Stewart’s annual requirement for these components is 8,000 units of B12 and 11,000 units of B18. Recently, Stewart’s management decided to devote additional machine time to other product lines resulting in only 41,000 machine hours per year that can be dedicated to the production of the bearings. An outside company has offered to sell Stewart the annual supply of the bearings at prices of $11.25 for B12 and $13.50 for B18. Stewart wants to schedule the otherwise idle 41,000 machine hours to produce bearings so that the company can minimize its costs (maximize its net benefits).

Note 1: Variable manufacturing overhead is applied on the basis of direct labor hours.

Note 2: Fixed manufacturing overhead is applied on the basis of machine hours.

The net benefit (loss) per machine hour that would result if Stewart accepts the supplier’s offer of $13.50 per unit for Component B18 is

- A. $.50
- B. $(1.00)
- C. $(1.75)
- D. Some amount other than those given.

- Answer (A) is incorrect because Subtracting $13.50 from $15.00 and dividing by 3 machine hours results in $.50.
- Answer (B) is correct. The variable costs of producing B18 total $10.50 ($3.75 + $4.50 + $2.25). Thus, purchasing at $13.50 would result in a loss of $3 per bearing. Given that each bearing requires 3 hours of machine time, the loss is $1 per machine hour.
- Answer (C) is incorrect because Not including variable manufacturing overhead when calculating the costs of producing B18 results in $(1.75) [($8.25 − $13.50) ÷ 3 machine hours].
- Answer (D) is incorrect because The loss per machine hour that results from buying a component is $(1.00) [($10.50 − $13.50) ÷ 3].

Stewart will maximize its net benefits by

- A. Purchasing 4,800 units of B12 and manufacturing the remaining bearings.
- B. Purchasing 8,000 units of B12 and manufacturing 11,000 units of B18.
- C. Purchasing 11,000 units of B18 and manufacturing 8,000 units of B12.
- D. Purchasing 4,000 units of B18 and manufacturing the remaining bearings.
• Answer (A) is incorrect because Purchasing 4,800 units of B12 will increase the company’s costs by $3 per B12 bearing. Purchasing B18s costs less. The company should not purchase any B12 bearings.

• Answer (B) is incorrect because Purchasing B12 bearings is not cost effective. By manufacturing all the B12 units needed, the company can also produce 7,000 units of B18, so only 4,000 units of B18 need to be purchased.

• Answer (C) is incorrect because After manufacturing 8,000 units of B12, there are enough hours left to produce 7,000 units of B18, so only 4,000 units of B18 need to be purchased.

• Answer (D) is correct. Purchasing will increase the company’s costs by $3 ($11.25 – $2.25 – $4 – $2) for each B12 bearing, or $1.20 per hour ($3 ÷ 2.5 hrs). Buying B18 will only cost the company an additional $1 per machine hour [($13.50 – $3.75 – $4.50 – $2.25) ÷ 3 machine hours]. Thus, the company should make all the needed B12s and compensate for the machine hours constraint by purchasing B18s. Given that each unit of B12 requires 2.5 hours of machine time, the company can produce the needed 8,000 units in 20,000 hours (2.5 × 8,000). The remaining 21,000 hours (41,000 – 20,000) can then be used for the production of 7,000 B18s (21,000 ÷ 3 hrs.). Because the annual requirement of B18s is 11,000 units, the other 4,000 units will have to be purchased.

[1246] Refers to Fact Pattern #135

Assume that Stewart’s idle capacity of 41,000 machine hours has a traceable avoidable annual fixed cost of $44,000 that will continue if the capacity is not used. The maximum price Stewart would be willing to pay a supplier for component B18 is

A. $10.50
B. $14.00
C. $14.50
D. Some amount other than those given.

• Answer (A) is incorrect because The maximum price Stewart would pay for B18 if it had sufficient idle capacity to produce its annual requirement of both bearings is $10.50.

• Answer (B) is incorrect because The maximum price for B18 is $14.10 [($3.75 + $4.50 + $2.25 = $10.50) + ($1.20 × 3 hours)].

• Answer (C) is incorrect because The maximum price for B18 is $14.10 [($3.75 + $4.50 + $2.25 = $10.50) + ($1.20 × 3 hours)].

• Answer (D) is correct. If Stewart had sufficient idle capacity to manufacture its annual requirements of both bearings, it would be willing to pay no more than $10.50 ($3.75 + $4.50 + $2.25) for a unit of B18. Since the given fixed cost will continue if the idle capacity is not used, Stewart would increase its costs by paying more than the unit variable cost ($3.75 + $4.50 + $2.25 = $10.50). However, Stewart must purchase some bearings because it has insufficient idle capacity to produce its requirements. The given suppliers’ prices for B12 and B18 result in a loss per machine hour of $1.20 and $1.00, respectively. At those prices, Stewart should manufacture all its requirements of B12 and purchase some units of B18. Assuming the given price of B12 is held constant, Stewart would benefit from purchasing B12 only if the loss per hour from buying B18 exceeded $1.20 per hour, or $3.60 per bearing (3 hrs. × $1.20). The maximum price for B18 is thus $14.10 ($10.50 + $3.60).
Cohasset Company currently manufactures all component parts used in the manufacture of various hand tools. A handle is used in three different tools. The unit cost budget for 20,000 handles is:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct material</td>
<td>$0.60</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$0.40</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>$0.10</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>$0.20</td>
</tr>
<tr>
<td><strong>Total unit cost</strong></td>
<td><strong>$1.30</strong></td>
</tr>
</tbody>
</table>

R&M Steel has offered to supply 20,000 handles to Cohasset for $1.25 each, delivered. If Cohasset currently has idle capacity that cannot be used, accepting the offer will:

A. Decrease the handle unit cost by $.05.  
B. Increase the handle unit cost by $.15.  
C. Decrease the handle unit cost by $.15.  
D. Increase the handle unit cost by $.05.

- Answer (A) is incorrect because The firm will incur the fixed costs whether it buys the parts or not.  
- Answer (B) is correct. Since the fixed cost will be incurred whether the company makes or buys the part, the relevant unit cost of making the part is the $1.10 variable cost ($1.30 – $.20 fixed overhead). The existence of idle capacity indicates that the firm has no opportunity cost to be considered in the calculation. Thus, accepting the offer would increase costs by $0.15 per unit.  
- Answer (C) is incorrect because The firm will incur the fixed costs whether it buys the parts or not.  
- Answer (D) is incorrect because The firm will incur the fixed costs whether it buys the parts or not.

[Fact Pattern #136]

Regis Company manufactures plugs used in its manufacturing cycle at a cost of $36 per unit that includes $8 of fixed overhead. Regis needs 30,000 of these plugs annually, and Orlan Company has offered to sell these units to Regis at $33 per unit. If Regis decides to purchase the plugs, $60,000 of the annual fixed overhead applied will be eliminated, and the company may be able to rent the facility previously used for manufacturing the plugs.

If Regis Company purchases the plugs but does not rent the unused facility, the company would:

A. Save $3.00 per unit.  
B. Lose $6.00 per unit.  
C. Save $2.00 per unit.  
D. Lose $3.00 per unit.

- Answer (A) is incorrect because A $3.00 savings is the difference between the current cost of $36.00 per unit and the purchase price of $33.00 per unit. It does not take into account the relevant costs.  
- Answer (B) is incorrect because The fixed overhead per unit that is unavoidable is $6.00.  
- Answer (C) is incorrect because The fixed overhead per unit that will be eliminated by purchasing is $2.00.
Answer (D) is correct. Exclusive of the fixed overhead, the unit cost of making the plugs is $28 ($36 total cost – $8 fixed OH). Purchasing the plugs will avoid $2 per unit of fixed overhead ($60,000 OH applied ÷ 30,000 units). Accordingly, $6 per unit of fixed overhead is unavoidable, and the relevant (avoidable) unit cost of making the plugs is $30 [$36 total cost – ($8 fixed OH – $2 avoidable cost)]. The purchase option therefore results in a $3-per-unit loss ($33 purchase price – $30 relevant cost).

[1249] (Refers to Fact Pattern #136)

If the plugs are purchased and the facility rented, Regis Company wishes to realize $100,000 in savings annually. To achieve this goal, the minimum annual rent on the facility must be

A. $10,000  
B. $40,000  
C. $70,000  
D. $190,000

Answer (A) is incorrect because The loss from purchasing must be added to the targeted savings to calculate the minimum annual rate.  
Answer (B) is incorrect because The loss from purchasing must be added to the targeted savings to calculate the minimum annual rate.  
Answer (C) is incorrect because The loss from purchasing must be added to the targeted savings to calculate the minimum annual rate.  
Answer (D) is correct. Without regard to rental of idle production capacity, the company will lose $3 per unit ($33 purchase price – $30 relevant cost) by purchasing the plugs. The total annual loss will be $90,000 (30,000 units × $3). Consequently, to achieve the targeted savings, the minimum annual rent must be $190,000 ($90,000 loss from purchasing + $100,000 targeted savings).

[Fact Pattern #137]

Leland Manufacturing uses 10 units of Part Number KJ37 each month in the production of radar equipment. The unit cost to manufacture 1 unit of KJ37 is presented below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$1,000</td>
</tr>
<tr>
<td>Materials handling (20% of direct material cost)</td>
<td>200</td>
</tr>
<tr>
<td>Direct labor</td>
<td>8,000</td>
</tr>
<tr>
<td>Manufacturing overhead (150% of direct labor)</td>
<td>12,000</td>
</tr>
<tr>
<td><strong>Total manufacturing cost</strong></td>
<td><strong>$21,200</strong></td>
</tr>
</tbody>
</table>

Material handling represents the direct variable costs of the Receiving Department that are applied to direct materials and purchased components on the basis of their cost. This is a separate charge in addition to manufacturing overhead. Leland’s annual manufacturing overhead budget is one-third variable and two-thirds fixed. Scott Supply, one of Leland’s reliable vendors, has offered to supply Part Number KJ37 at a unit price of $15,000.
If Leland purchases the KJ37 units from Scott, the capacity Leland used to manufacture these parts would be idle. Should Leland decide to purchase the parts from Scott, the unit cost of KJ37 would

A. Increase by $4,800.
B. Decrease by $6,200.
C. Decrease by $3,200.
D. Change by some amount other than those given.

- Answer (A) is correct. In addition to the $15,000 purchase price, the company would still incur $8,000 per unit of unavoidable (fixed) manufacturing overhead (2/3 of $12,000). The materials handling charge of 20% of the purchase price of components would add another $3,000 per unit ($15,000 × .2). Therefore, the unit cost of purchase would be $26,000 ($15,000 + $8,000 + $3,000), which is $4,800 more than the current cost to manufacture.
- Answer (B) is incorrect because a decrease of $6,200 assumes the cost to purchase the units is only $15,000.
- Answer (C) is incorrect because a decrease of $3,200 does not include the $8,000 of fixed overhead costs.
- Answer (D) is incorrect because the unit cost would increase by $4,800.

Assume Leland Manufacturing is able to rent all idle capacity for $25,000 per month. If Leland decides to purchase the 10 units from Scott Supply, Leland’s monthly cost for KJ37 would

A. Increase $48,000.
B. Increase $23,000.
C. Decrease $7,000.
D. Change by some amount other than those given.

- Answer (A) is incorrect because an increase of $48,000 does not include the $25,000 of rental income.
- Answer (B) is correct. Purchasing would increase unit cost by $4,800 ($26,000 cost to purchase – $21,200 cost to manufacture), an increase of $48,000 per month (10 units × $4,800). However, the $25,000 of rental income would reduce the increase in net costs to $23,000 per month.

The unit cost of purchase of $26,000, is calculated as follows:

\[
\begin{align*}
\text{Cost to purchase} & = \text{Purchase price} \\
& + 8,000 \text{ of unavoidable overhead} \times \frac{2}{3} \\
& + 3,000 \text{ materials handling charge} \times 0.2 \times 10 \\
& = 26,000 \\
\end{align*}
\]

- Answer (C) is incorrect because a decrease of $7,000 assumes an increase in unit cost of $1,800.
- Answer (D) is incorrect because the monthly cost would increase by $23,000.
Assume that Leland Manufacturing does not wish to commit to a rental agreement but could use idle capacity to manufacture another product that would contribute $52,000 per month. If Leland elects to manufacture KJ37 in order to maintain quality control, Leland’s opportunity cost is

- **A. $18,000**
- **B. $(20,000)**
- **C. $4,000**
- **D. Some amount other than those given**

- **Answer (A) is incorrect because** The additional total monthly cost of purchasing KJ37 should be subtracted from the additional contribution from the other product to determine the net benefit or loss.
- **Answer (B) is incorrect because** The additional total monthly cost of purchasing KJ37 should be subtracted from the additional contribution from the other product to determine the net benefit or loss.
- **Answer (C) is correct.** Opportunity cost is the maximum alternative earnings that might have been obtained if the productive good, service, or capacity had been applied to some alternative use. The additional total monthly cost of purchasing the component is $48,000. If the idle facilities could be used to produce a product contributing $52,000 per month, the net benefit opportunity cost of manufacture would be $4,000.
- **Answer (D) is incorrect because** The opportunity cost equals $4,000 ($52,000 – $48,000).

Richardson Motors uses 10 units of Part No. T305 each month in the production of large diesel engines. The cost to manufacture one unit of T305 is presented as follows:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>$ 2,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials handling (20% of direct materials cost)</td>
<td>400</td>
</tr>
<tr>
<td>Direct labor</td>
<td>16,000</td>
</tr>
<tr>
<td>Manufacturing overhead (150% of direct labor)</td>
<td>24,000</td>
</tr>
<tr>
<td><strong>Total manufacturing cost</strong></td>
<td><strong>$42,400</strong></td>
</tr>
</tbody>
</table>

Materials handling, which is not included in manufacturing overhead, represents the direct variable costs of the receiving department that are applied to direct materials and purchased components on the basis of their cost. Richardson’s annual manufacturing overhead budget is one-third variable and two-thirds fixed. Simpson Castings, one of Richardson’s reliable vendors, has offered to supply T305 at a unit price of $30,000.

If Richardson Motors purchases the ten T305 units from Simpson Castings, the capacity Richardson used to manufacture these parts would be idle. Should Richardson decide to purchase the parts from Simpson, the out-of-pocket cost per unit of T305 would

- **A. Decrease $6,400.**
- **B. Increase $3,600.**
- **C. Increase $9,600.**
- **D. Decrease $12,400.**

- **Answer (A) is incorrect because** Assuming all of the overhead is variable results in $6,400.
- **Answer (B) is incorrect because** Overlooking the $6,000 of receiving costs for purchased components results in $3,600.
Answer (C) is correct. The out-of-pocket cost of making the part equals the total manufacturing cost minus the fixed overhead, or $26,400 \([42,400 - \{(2 ÷ 3) \times 24,000]\]). The cost of the component consists of the $30,000 purchase price plus the $6,000 (20% of cost) of variable receiving costs, or a total of $36,000. Thus, unit out-of-pocket cost would increase by $9,600 if the components were purchased.

Answer (D) is incorrect because The difference between the full cost of making the part and the price of the component is $12,400.

[1254](Refers to Fact Pattern #138)

Assume Richardson Motors is able to rent all idle capacity for $50,000 per month. If Richardson decides to purchase the 10 units from Simpson Castings, Richardson’s monthly cost for T305 would

A. Decrease $14,000.
B. Increase $46,000.
C. Decrease $64,000.
D. Increase $96,000.

Answer (A) is incorrect because Overlooking the $6,000 per unit of receiving costs for purchased components results in $14,000.

Answer (B) is correct. The out-of-pocket cost of making the part equals the total manufacturing cost minus the fixed overhead, or $26,400 \([42,400 - \{(2 ÷ 3) \times 24,000]\]). The cost of the component consists of the $30,000 purchase price plus the $6,000 (20% of cost) of variable receiving costs, or a total of $36,000. Thus, unit out-of-pocket cost would increase by $9,600 if the components were purchased.

For 10 components, the total cost increase would be $96,000, but the $50,000 rental would reduce the net increase to $46,000.

Answer (C) is incorrect because Assuming all overhead is variable and ignoring rental revenue results in $64,000.

Answer (D) is incorrect because Overlooking the rental revenue results in $96,000.

[1255](Refers to Fact Pattern #138)

Assume the rental opportunity does not exist and Richardson Motors could use the idle capacity to manufacture another product that would contribute $104,000 per month. If Richardson chooses to manufacture the ten T305 units in order to maintain quality control, Richardson’s opportunity cost is

A. $68,000
B. $88,000
C. $8,000
D. $(96,000)

Answer (A) is incorrect because This amount overlooks the $6,000 per unit of receiving costs for purchased components.

Answer (B) is incorrect because This amount assumes only one-third of the overhead is fixed.

Answer (C) is correct. The out-of-pocket cost of making the part equals the total manufacturing cost minus the fixed overhead, or $26,400 \([42,400 - \{(2 ÷ 3) \times 24,000]\]). The cost of the component consists of the $30,000 purchase price plus the $6,000 (20% of cost) of variable receiving costs, or a total of $36,000. Thus, unit out-of-pocket cost would increase by $9,600 if the components were purchased.

For 10 units, the additional cost of purchasing is $96,000. However, the net effect of purchasing is a gain of $8,000 ($104,000 contribution from making another product – $96,000). Opportunity cost is the benefit from the next best alternative use of the resources. Hence, the company’s opportunity cost of making the part is $8,000.
Answer (D) is incorrect because this amount ignores the $104,000 income from alternative production.

[Fact Pattern #139]
Refrigerator Company manufactures ice-makers for installation in refrigerators. The costs per unit, for 20,000 units of ice-makers, are as follows.

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$7</td>
</tr>
<tr>
<td>Direct labor</td>
<td>12</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>5</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>$34</strong></td>
</tr>
</tbody>
</table>

Cool Compartments, Inc., has offered to sell 20,000 ice-makers to Refrigerator Company for $28 per unit. If Refrigerator accepts Cool Compartments’ offer, two alternatives are available for the ice-maker manufacturing plant: the plant can be idled or it can be retooled to produce water filtration units.

[1256](Refers to Fact Pattern #139)
If Refrigerator retools its existing plant, revenues from the sale of water filtration units are estimated at $80,000, with variable costs amounting to 60% of sales. In addition, $6 per unit of the fixed overhead associated with the manufacture of ice-makers could be eliminated. For Refrigerator Company to determine the most appropriate action to take in this situation, the total relevant costs of make vs. buy, respectively, are

- A. $600,000 vs. $560,000.
- B. $648,000 vs. $528,000.
- C. $600,000 vs. $528,000.
- D. $680,000 vs. $440,000.

- Answer (A) is incorrect because the relevant cost of buying is $528,000.
- Answer (B) is incorrect because the relevant cost of making is $600,000.
- Answer (C) is correct. Relevant costs are those that vary depending on the option chosen. Thus, $4 per unit of fixed overhead (20,000 units × $4 = $80,000) will be incurred regardless of the option chosen. This amount is irrelevant to the decision. The costs eliminated by buying ice-makers are the relevant costs of making the ice-makers. They equal $24 per unit ($7 + $12 + $5) of variable costs (20,000 units × $24 = $480,000) and $6 per unit of fixed costs (20,000 units × $6 = $120,000), a total of $600,000. If the ice-makers are bought, and the plant is retooled, the contribution margin from the sale of water filters is $32,000 ($80,000 × 40%). Thus, the $560,000 price of ice-makers (20,000 units × $28) is reduced by $32,000, giving relevant costs of buying of $528,000.
- Answer (D) is incorrect because the two costs are $600,000 and $528,000.
Aril Industries is a multiproduct company that currently manufactures 30,000 units of Part 730 each month for use in production. The facilities now being used to produce Part 730 have fixed monthly overhead costs of $150,000 and a theoretical capacity to produce 60,000 units per month. If Aril were to buy Part 730 from an outside supplier, the facilities would be idle and 40% of fixed costs would continue to be incurred. There are no alternative uses for the facilities. The variable production costs of Part 730 are $11 per unit. Fixed overhead is allocated based on planned production levels. If Aril Industries continues to use 30,000 units of Part 730 each month, it would realize a net benefit by purchasing Part 730 from an outside supplier only if the supplier’s unit price is less than

A. $12.00  
B. $12.50  
C. $13.00  
D. $14.00

- Answer (A) is incorrect because the amount of $12.00 results from allocating 40% of fixed costs instead of 60%, and from allocating fixed costs based on the full capacity of 60,000 units rather than the actual production.
- Answer (B) is incorrect because the amount of $12.50 results from allocating fixed costs based on the full capacity of 60,000 units rather than the actual production.
- Answer (C) is incorrect because the amount of $13.00 results from allocating 40% of fixed costs rather than 60%.
- Answer (D) is correct. The relevant cost to Aril has two components. One is its own variable production cost for Part 730 ($11). The other is that portion of fixed costs that are incurred if production is done in-house ($150,000 \times 60\% = $90,000); on a per-unit basis, this translates into $3 ($90,000 \div 30,000 = $3). The total threshold for the outside supplier’s price is therefore $14 ($11 + $3).

GiantCo has received an offer from PatriotCo to produce units that GiantCo currently produces and sells. The unit price quoted by PatriotCo is higher than GiantCo’s variable production cost per unit but lower than the price at which GiantCo can market the units. Under which circumstance would GiantCo’s profits increase by purchasing units from PatriotCo?

A. Market demand for the product exceeds GiantCo’s capacity.  
B. GiantCo’s fixed overhead would remain the same if GiantCo purchased units from PatriotCo.  
C. GiantCo has significant sunk costs.  
D. GiantCo’s administrative costs are zero.

- Answer (A) is correct. If not enough capacity is available to produce all products demanded, products should be outsourced or capacity should be expanded to increase profits.
- Answer (B) is incorrect because costs that do not differ between two alternatives should be ignored because they are irrelevant to the decision being made.
- Answer (C) is incorrect because sunk costs are irrelevant in decision making.
- Answer (D) is incorrect because this answer is a distractor and does not have a bearing on the decision. Also, costs that do not differ between two alternatives should be ignored because they are irrelevant to the decision being made.

When a multiproduct plant operates at full capacity, quite often decisions must be made as to which products to emphasize. These decisions are frequently made with a short-run focus. In making such decisions, managers should select products with the highest

A. Sales price per unit.  
B. Individual unit contribution margin.  
C. Sales volume potential.  
D. Contribution margin per unit of the constraining resource.
Polar Company sells refrigeration components both in the U.S. and to a subsidiary located in France. One of the components, Part No. 456, has a variable manufacturing cost of $30. The part can be sold domestically or shipped to the French subsidiary for use in the manufacture of a residential subassembly. Relevant data with regard to Part No. 456 are shown below.

<table>
<thead>
<tr>
<th>Part No. 456</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic selling price</td>
<td>$65</td>
</tr>
<tr>
<td>Shipping charges to France</td>
<td>15</td>
</tr>
<tr>
<td>Cost of acquiring Part No. 456 in France</td>
<td>75</td>
</tr>
<tr>
<td>French residential subassembly:</td>
<td></td>
</tr>
<tr>
<td>Sales price</td>
<td>170</td>
</tr>
<tr>
<td>Other additional manufacturing costs</td>
<td>55</td>
</tr>
<tr>
<td>Units shipped to France</td>
<td>150,000*</td>
</tr>
</tbody>
</table>

*If deemed preferable, these units could be sold in the U.S.

Polar’s applicable income tax rates are 40% in the U.S. and 70% in France.

Polar will transfer Part No. 456 to the French subsidiary at either variable manufacturing cost or the domestic market price. On the basis of this information, which one of the following strategies should be recommended to Polar’s management?

A. Transfer 150,000 units at $30 and the French subsidiary pays the shipping costs.
B. Transfer 150,000 units at $65 and the French subsidiary pays the shipping costs.
C. Sell 150,000 units in the U.S. and the French subsidiary obtains Part No. 456 in France.
D. Transfer 150,000 units at $65 and have the U.S. company absorb the shipping costs.

- Answer (A) is incorrect because If the components are transferred at cost, no tax will be paid in the U.S., and the per-unit tax on French sales of the subassembly will be $49 [(170 – 30 – 15 – 55) × .7]. Thus, the consolidated entity’s per-unit profit will be $21 (170 – 30 – 15 – 55 – 49).
- Answer (B) is incorrect because If the transfer is at $65, U.S. tax per unit will be $14 [(65 – 30) × .4], and the French tax per unit will be $24.50 [(170 – 65 – 15 – 55) × .7]. The consolidated entity’s per-unit profit will therefore be $31.50 (170 – 30 – 15 – 55 – 14 – 24.50).
- Answer (C) is correct. If the 150,000 components are sold separately in the U.S., the after-tax profit per unit will be $21 [(65 – 30) × .6]. The French subsidiary will then purchase 150,000 components domestically to include in the subassembly. The per-unit profit on sales of the subassembly will be $12 [(170 – 75 – 55) × .3]. The total per-unit profit for the consolidated entity from these transactions will therefore be $33 (21 + 12).
- Answer (D) is incorrect because If the transfer is at $65 and the U.S. parent pays the shipping costs, the U.S. tax per unit will be $8 [(65 – 30 – 15) × .4], and the French tax per unit will be $35 [(170 – 65 – 55) × .7]. The consolidated entity’s per-unit profit will be $27 (170 – 30 – 15 – 55 – 8 – 35).
[Fact Pattern #140]
Geary Manufacturing has assembled the data appearing in the next column pertaining to two products. Past experience has shown that the unavoidable fixed manufacturing factory overhead included in the cost per machine hour averages $10. Geary has a policy of filling all sales orders, even if it means purchasing units from outside suppliers. Total machine capacity is 50,000 hours.

<table>
<thead>
<tr>
<th></th>
<th>Blender</th>
<th>Electric Mixer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$ 6</td>
<td>$11</td>
</tr>
<tr>
<td>Direct labor</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Manufacturing overhead at $16 per hour</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Cost if purchased from an outside supplier</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>Annual demand (units)</td>
<td>20,000</td>
<td>28,000</td>
</tr>
</tbody>
</table>

[1261] Refers to Fact Pattern #140

If Geary Manufacturing desires to follow an optimal strategy, it should produce

A. 25,000 electric mixers and purchase all other units as needed.
B. 20,000 blenders and 15,000 electric mixers, and purchase all other units as needed.
C. 20,000 blenders and purchase all other units as needed.
D. 28,000 electric mixers and purchase all other units as needed.

- Answer (A) is incorrect because Producing 25,000 mixers results in a total variable cost of $1,314,000.
- Answer (B) is correct. Sales (20,000 blenders and 28,000 mixers) and total revenue are constant, so the strategy is to minimize total variable cost. For blenders, the unit variable cost is $16 ($6 DM + $4 DL + $6 VOH). For each blender made, the company saves $4 ($20 – $16), or $4 ($4 ÷ 1 hr.) per unit of the constrained resource. The unit variable cost to make a mixer is $32 ($11 DM + $9 DL + $12 VOH). The savings is $6 per mixer ($38 – $32), or $3 ($6 ÷ 2 hours) per unit of the constrained resource. Thus, as many blenders as possible should be made. If 20,000 hours (20,000 units × 1 hour) are used for blenders, 30,000 hours are available for 15,000 mixers. Total variable cost will be $1,294,000 [(20,000 blenders × $16) + (15,000 mixers × $32) + (13,000 mixers × $38)].
- Answer (C) is incorrect because Producing 20,000 blenders and no mixers increases costs by $90,000 (15,000 units × $6).
- Answer (D) is incorrect because The company can produce at most 25,000 mixers.

[1262] Refers to Fact Pattern #140

With all other things constant, if Geary Manufacturing is able to reduce the direct materials for an electric mixer to $6 per unit, the company should

A. Produce 25,000 electric mixers and purchase all other units as needed.
B. Produce 20,000 blenders and 15,000 electric mixers, and purchase all other units as needed.
C. Produce 20,000 blenders and purchase all other units as needed.
D. Purchase all units as needed.
Answer (A) is correct. Reducing unit direct materials cost for mixers from $11 to $6 decreases unit variable cost to $27 ($6 DM + $9 DL + $12 VOH) and increases the cost savings of making a mixer from $6 to $11, or $5.50 per hour ($11 ÷ 2 hours per unit). Given a cost savings per hour for blenders of $4, the company can minimize total variable cost by making 25,000 mixers (50,000 hours capacity ÷ 2). Total variable cost will be $1,189,000 [(25,000 mixers × $27) + (3,000 mixers × $38) + (20,000 blenders × $20)].

Answer (B) is incorrect because Producing 20,000 blenders and 15,000 mixers results in a total variable cost of $1,219,000.

Answer (C) is incorrect because Producing 20,000 blenders results in a total variable cost of $1,384,000.

Answer (D) is incorrect because The variable cost of making these items is less than the cost of purchase.

Green Company produces Product A and sells it for $18.00. The following cost data apply:

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials (3 lb. × $1.50)</td>
<td>$4.50</td>
</tr>
<tr>
<td>Direct labor</td>
<td>6.45</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>1.35</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>1.50</td>
</tr>
<tr>
<td>Variable selling expense</td>
<td>1.10</td>
</tr>
<tr>
<td>Fixed selling expense</td>
<td>2.20</td>
</tr>
<tr>
<td><strong>Total unit cost</strong></td>
<td><strong>$17.10</strong></td>
</tr>
</tbody>
</table>

Green has thought of marketing a new Product B with the same cost structure as Product A except that the price will be $15.60. Green Company currently has the plant capacity necessary for this expansion. Because of the cost structure, Green Company will find the production and sale of Product B in the short run to be

A. Not profitable unless the price can be raised to $17.10.
B. Not profitable at any price.
C. Not profitable at $15.60 because the fixed selling expense and fixed manufacturing overhead will not be covered by the price.
D. Profitable to produce and sell Product B in the short run at the price of $15.60.

- Answer (A) is incorrect because The cost for Product B in the short run will be lower than $17.10 because the fixed costs of $3.70 would not be included in the incremental cost of Product B.
- Answer (B) is incorrect because Product B would be profitable at a $15.60 selling price.
- Answer (C) is incorrect because In the short run, the fixed expenses and overhead do not need to be included in the cost of Product B because they are all covered by Product A.
- Answer (D) is correct. With excess capacity, production is profitable if the incremental revenues are greater than the incremental costs. Here, the incremental costs equal total costs minus any fixed costs ($17.10 – $1.50 – $2.20 = $13.40). If Product B can be sold for a price greater than $13.40, short-run production will be profitable. Long-run profitability, however, will depend on fixed costs as well as variable costs and sales price.
Whitehall Corporation produces chemicals used in the cleaning industry. During the previous month, Whitehall incurred $300,000 of joint costs in producing 60,000 units of AM-12 and 40,000 units of BM-36. Whitehall uses the units-of-production method to allocate joint costs. Currently, AM-12 is sold at split-off for $3.50 per unit. Flank Corporation has approached Whitehall to purchase all of the production of AM-12 after further processing. The further processing will cost Whitehall $90,000.

Concerning AM-12, which one of the following alternatives is most advantageous?

A. Whitehall should process further and sell to Flank if the total selling price per unit after further processing is greater than $3.00, which covers the joint costs.
B. Whitehall should continue to sell at split-off unless Flank offers at least $4.50 per unit after further processing, which covers Whitehall’s total costs.
C. Whitehall should process further and sell to Flank if the total selling price per unit after further processing is greater than $5.00.
D. Whitehall should process further and sell to Flank if the total selling price per unit after further processing is greater than $5.25, which maintains the same gross profit percentage.

- Answer (A) is incorrect because the joint costs are irrelevant.
- Answer (B) is incorrect because the unit price must cover the $3.50 opportunity cost plus the $1.50 of additional costs.
- Answer (C) is correct. The unit price of the product at the split-off point is known to be $3.50, so the joint costs are irrelevant. The additional unit cost of further processing is $1.50 ($90,000 ÷ 60,000 units). Consequently, the unit price must be at least $5.00 ($3.50 opportunity cost + $1.50).
- Answer (D) is incorrect because any price greater than $5 will provide greater profits, in absolute dollars, even though the gross profit percentage declines.

Assume that Whitehall Corporation agreed to sell AM-12 to Flank Corporation for $5.50 per unit after further processing. During the first month of production, Whitehall sold 50,000 units with 10,000 units remaining in inventory at the end of the month. With respect to AM-12, which one of the following statements is true?

A. The operating profit last month was $50,000, and the inventory value is $15,000.
B. The operating profit last month was $50,000, and the inventory value is $45,000.
C. The operating profit last month was $125,000, and the inventory value is $30,000.
D. The operating profit last month was $200,000, and the inventory value is $30,000.

- Answer (A) is incorrect because the $3 unit joint cost should be included in the inventory value.
- Answer (B) is correct. Joint costs are allocated based on units of production. Accordingly, the unit joint cost allocated to AM-12 is $3.00 ($300,000 ÷ (60,000 units of AM-12 + 40,000 units of BM-36)). The unit cost of AM-12 is therefore $4.50 [$3.00 joint cost + ($90,000 additional cost ÷ 60,000 units)]. Total inventory value is $45,000 (10,000 units × $4.50), and total operating profit is $50,000 [50,000 units sold × ($5.50 unit price − $4.50 unit cost)].
- Answer (C) is incorrect because the $1.50 unit additional cost should be included in total unit cost.
- Answer (D) is incorrect because the $3 unit joint cost should be included in the cost of goods sold, and inventory should include the $1.50 unit additional cost.
In joint-product costing and analysis, which one of the following costs is relevant when deciding the point at which a product should be sold to maximize profits?

A. Separable costs after the split-off point.
B. Joint costs to the split-off point.
C. Sales salaries for the period when the units were produced.
D. Purchase costs of the materials required for the joint products.

- Answer (A) is correct. Joint products are created from processing a common input. Joint costs are incurred prior to the split-off point and cannot be identified with a particular joint product. As a result, joint costs are irrelevant to the timing of sale. However, separable costs incurred after the split-off point are relevant because, if incremental revenues exceed the separable costs, products should be processed further, not sold at the split-off point.
- Answer (B) is incorrect because Joint costs have no effect on the decision as to when to sell a product.
- Answer (C) is incorrect because Sales salaries for the production period do not affect the decision.
- Answer (D) is incorrect because Purchase costs are joint costs.

Copeland, Inc., produces X-547 in a joint manufacturing process. The company is studying whether to sell X-547 at the split-off point or upgrade the product to become Xylene. The following information has been gathered:

I. Selling price per pound of X-547
II. Variable manufacturing costs of upgrade process
III. Avoidable fixed costs of upgrade process
IV. Selling price per pound of Xylene
V. Joint manufacturing costs to produce X-547

Which items should be reviewed when making the upgrade decision?

- Answer (A) is incorrect because The joint manufacturing costs are the only irrelevant item.
- Answer (B) is correct. Common, or joint, costs cannot be identified with a particular joint product. By definition, joint products have common costs until the split-off point. Costs incurred after the split-off point are separable costs. The decision to continue processing beyond split-off is made separately for each product. The costs relevant to the decision are the separable costs because they can be avoided by selling at the split-off point. They should be compared with the incremental revenues from processing further. Thus, items I. (revenue from selling at split-off point), II. (variable costs of upgrade), III. (avoidable fixed costs of upgrade), and IV. (revenue from selling after further processing) are considered in making the upgrade decision.
- Answer (C) is incorrect because The joint manufacturing costs are the only irrelevant item.
- Answer (D) is incorrect because The joint manufacturing costs are the only irrelevant item.
A firm produces two joint products (A and B) from one unit of raw material, which costs $1,000. Product A can be sold for $700 and product B can be sold for $500 at the split-off point. Alternatively, both A and/or B can be processed further and sold for $900 and $1,200, respectively. The additional processing costs are $100 for A and $750 for B. Should the firm process products A and B beyond the split-off point?

A. Both A and B should be processed further.
B. Only B should be processed further.
C. Only A should be processed further.
D. Neither product should be processed further.

- Answer (A) is incorrect because Only A should be processed further.
- Answer (B) is incorrect because Only A should be processed further.
- Answer (C) is correct. The incremental costs ($100) for A are less than the incremental revenue ($200). However, the incremental costs of B ($750) exceed the incremental revenue ($700). Consequently, the firm should process A further and sell B at the split-off point.
- Answer (D) is incorrect because Only A should be processed further.

**[Fact Pattern #142]**

N-Air Corporation uses a joint process to produce three products: A, B, and C, all derived from one input. The company can sell these products at the point of split-off (end of the joint process) or process them further. The joint production costs during October were $10,000. N-Air allocates joint costs to the products in proportion to the relative physical volume of output. Additional information is presented in the opposite column.

<table>
<thead>
<tr>
<th>Product</th>
<th>Units Produced</th>
<th>Unit Sales Price at Split-off</th>
<th>Unit Sales Price</th>
<th>Unit Additional Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1,000</td>
<td>$4.00</td>
<td>$5.00</td>
<td>$.75</td>
</tr>
<tr>
<td>B</td>
<td>2,000</td>
<td>2.25</td>
<td>4.00</td>
<td>1.20</td>
</tr>
<tr>
<td>C</td>
<td>1,500</td>
<td>3.00</td>
<td>3.75</td>
<td>.90</td>
</tr>
</tbody>
</table>

Assuming that all products were sold at the split-off point during October, the gross profit from the production process would be

A. $13,000
B. $10,000
C. $8,625
D. $3,000

- Answer (A) is incorrect because This amount is the total sales if all products are sold at split-off.
- Answer (B) is incorrect because This amount is the joint production cost during October.
- Answer (C) is incorrect because If all products were sold at split-off, total sales are determined by multiplying units produced by the unit sales price at split-off, not the unit sales price if processed further.
Answer (D) is correct. If all products are sold at split-off, the gross profit is computed as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Units × Price</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (1,000 × $4.00)</td>
<td></td>
<td>$4,000</td>
</tr>
<tr>
<td>B (2,000 × $2.25)</td>
<td></td>
<td>4,500</td>
</tr>
<tr>
<td>C (1,500 × $3.00)</td>
<td></td>
<td>4,500</td>
</tr>
<tr>
<td><strong>Total sales</strong></td>
<td></td>
<td><strong>$13,000</strong></td>
</tr>
<tr>
<td><strong>Joint costs</strong></td>
<td></td>
<td>(10,000)</td>
</tr>
<tr>
<td><strong>Gross profit</strong></td>
<td></td>
<td><strong>$3,000</strong></td>
</tr>
</tbody>
</table>

[1270] Refers to Fact Pattern #142)

Assuming sufficient demand exists, N-Air could sell all the products at the prices previously mentioned at either the split-off point or after further processing. To maximize its profits, N-Air Corporation should

A. Sell product A at split-off and perform additional processing on products B and C.
B. Sell product B at split-off and perform additional processing on products C and A.
C. Sell product C at split-off and perform additional processing on products A and B.
D. Sell products A, B, and C at split-off.

- Answer (A) is incorrect because N-Air should further process products A and B and sell product C at split-off.
- Answer (B) is incorrect because N-Air should further process products A and B and sell product C at split-off.
- Answer (C) is correct. To maximize profits, it must be determined whether each product’s incremental revenues will exceed its incremental costs. Joint costs are irrelevant because they are sunk costs.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit sales price if processed further</td>
<td>$5.00</td>
<td>$4.00</td>
<td>$3.75</td>
</tr>
<tr>
<td>Minus: unit sales price at split-off</td>
<td>(4.00)</td>
<td>(2.25)</td>
<td>(3.00)</td>
</tr>
<tr>
<td>Incremental revenue per unit</td>
<td>$1.00</td>
<td>$1.75</td>
<td>$.75</td>
</tr>
<tr>
<td>Minus: incremental unit cost</td>
<td>(.75)</td>
<td>(1.20)</td>
<td>(.90)</td>
</tr>
<tr>
<td>Excess unit revenue over unit cost</td>
<td>$ .25</td>
<td>.55</td>
<td>(.15)</td>
</tr>
</tbody>
</table>

It is most profitable for N-Air to process products A and B further and to sell product C at the split-off point.

- Answer (D) is incorrect because N-Air should further process products A and B and sell product C at split-off.

[1271] A company has 7,000 obsolete toys carried in inventory at a manufacturing cost of $6 per unit. If the toys are reworked for $2 per unit, they could be sold for $3 per unit. If the toys are scrapped, they could be sold for $1.85 per unit. Which alternative is more desirable (rework or scrap), and what is the total dollar amount of the advantage of that alternative?

A. Scrap, $5,950.
B. Rework, $36,050.
C. Scrap, $47,950.
D. Rework, $8,050.

- Answer (A) is correct. The original manufacturing cost of $6 per unit is a sunk cost that is not relevant to this decision. The relevant costs are the amounts that must be expended now. Hence, selling the toys for scrap has a $5,950 advantage because rework will produce an additional $7,000 (7,000 × ($3 – $2)), whereas the alternative generates an additional $12,950 (7,000 × $1.85).
- Answer (B) is incorrect because the original manufacturing cost of $6 should not be added to the sales price.
Answer (C) is incorrect because The original manufacturing cost of $6 should not be added to the sales price.
Answer (D) is incorrect because The figure of $8,050 (rework) does not include the cost of the rework.

Milton Manufacturing occasionally has capacity problems in its metal shaping division, where the chief cost driver is machine hours. In evaluating the attractiveness of its individual products for decision-making purposes, which measurement tool should the firm select?

<table>
<thead>
<tr>
<th>If machine hours do not constrain the number of units to be produced</th>
<th>If machine hours constrain the number of units to be produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Contribution margin</td>
<td>Contribution margin per machine hour</td>
</tr>
<tr>
<td>B. Gross profit</td>
<td>Contribution margin</td>
</tr>
<tr>
<td>C. Contribution margin ratio</td>
<td>Contribution margin ratio</td>
</tr>
<tr>
<td>D. Contribution margin per machine hour</td>
<td>Contribution margin</td>
</tr>
</tbody>
</table>

Answer (A) is correct. If excess machine hours are available, the appropriate driver is the contribution margin that can be earned on each unit, that is, the machine should be used to generate as much coverage of fixed costs as possible. However, if machine hours are constrained, that is, if machine hours are the bottleneck, the best choice is to generate as much coverage of fixed costs as possible per hour of that scarce resource.

Answer (B) is incorrect because Gross profit is an absorption-costing amount, not suitable for internal decision making.

Answer (C) is incorrect because The contribution margin ratio is not a dollar amount, making it an unsuitable driver.

Answer (D) is incorrect because Contribution margin per hour is the appropriate driver if machine hours are a constraint.

Fact Pattern #143
Cervine Corporation makes two types of motors for use in various products. Operating data and unit cost information for its products are presented below.

<table>
<thead>
<tr>
<th>Product A</th>
<th>Product B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual unit capacity</td>
<td>10,000</td>
</tr>
<tr>
<td>Annual unit demand</td>
<td>10,000</td>
</tr>
<tr>
<td>Selling price</td>
<td>$100</td>
</tr>
<tr>
<td>Variable manufacturing cost</td>
<td>(53)</td>
</tr>
<tr>
<td>Fixed manufacturing cost</td>
<td>(10)</td>
</tr>
<tr>
<td>Variable selling &amp; administrative</td>
<td>(10)</td>
</tr>
<tr>
<td>Fixed selling &amp; administrative</td>
<td>(5)</td>
</tr>
<tr>
<td>Fixed other administrative</td>
<td>(2)</td>
</tr>
<tr>
<td>Unit operating profit</td>
<td>$ 20</td>
</tr>
<tr>
<td>Machine hours per unit</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Cervine has 40,000 productive machine hours available.
Cervine’s relevant contribution margins, per machine hour for each product, to be utilized in making a decision on product priorities for the coming year are:

<table>
<thead>
<tr>
<th>Product A</th>
<th>Product B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. $17.00</td>
<td>$14.00</td>
</tr>
<tr>
<td>B. $18.50</td>
<td>$16.00</td>
</tr>
<tr>
<td>C. $20.00</td>
<td>$10.00</td>
</tr>
<tr>
<td>D. $37.00</td>
<td>$24.00</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because the amounts of $17 and $14 result from improperly subtracting the unit operating profit and from failing to divide by the machine hours per unit.
- Answer (B) is correct. Cervine’s relevant margins can be calculated as follows:

| Sales price | $100 | $80  |
| Variable manufacturing cost | (53) | (45) |
| Variable S & A cost | (10) | (11) |
| Contribution margin | $37  | $24  |

Divided by: machine hours per unit ÷ 2.0 ÷ 1.5

| Contribution margin per hour | $18.50 | $16.00 |

- Answer (C) is incorrect because the amounts of $20 and $10 result from improperly subtracting fixed costs and from failing to divide by the machine hours per unit.
- Answer (D) is incorrect because the amounts of $37 and $24 are the contribution margins per unit, not per hour.

What is the maximum total contribution margin that Cervine can generate in the coming year?

- A. $665,000
- B. $690,000
- C. $850,000
- D. $980,000

- Answer (A) is incorrect because the amount of $665,000 results from filling the demand for Product B, which has the lower contribution margin per hour, first.
Answer (B) is correct. To fulfill the demand for Product A would require 20,000 machine hours (10,000 units × 2 hours per unit), and to fulfill the demand for Product B would require an additional 30,000 hours (20,000 units × 1.5 hours per unit). The total time required is therefore 50,000 hours, more hours than are available on Cervine’s machine. Since machine hours are the scarce resource, Cervine must determine the contribution margin per machine hour of the two products.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price</td>
<td>$100</td>
<td>$80</td>
</tr>
<tr>
<td>Variable manufacturing cost</td>
<td>(53)</td>
<td>(45)</td>
</tr>
<tr>
<td>Variable S &amp; A cost</td>
<td>(10)</td>
<td>(11)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$37</td>
<td>$24</td>
</tr>
<tr>
<td>Divided by: machine hours per unit</td>
<td>÷ 2.0</td>
<td>÷ 1.5</td>
</tr>
<tr>
<td>Contribution margin per hour</td>
<td>$18.50</td>
<td>$16.00</td>
</tr>
</tbody>
</table>

Cervine will manufacture as much as it can of the product with the higher contribution margin per hour, then use any time left over to manufacture the other. Cervine will thus first fill the demand for Product A, generating a contribution margin of $370,000 (20,000 hours × $18.50), and use the remaining 20,000 hours to manufacture Product B, generating a contribution margin of $320,000 (20,000 hours × $16.00). Total contribution margin is thus $690,000 ($370,000 + $320,000).

Answer (C) is incorrect because The amount of $850,000 results from ignoring the machine-hour constraint.

Answer (D) is incorrect because The amount of $980,000 results from ignoring the machine-hour constraint and reversing the demand levels for the two products.

[Lazar Industries produces two products, crates and trunks. Per unit selling prices, costs, and resource utilization for these products are as follows.]

<table>
<thead>
<tr>
<th></th>
<th>Crates</th>
<th>Trunks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$20</td>
<td>$30</td>
</tr>
<tr>
<td>Direct material costs</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Direct labor costs</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Variable overhead costs</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Variable selling costs</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Machine hours per unit</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

Production of crates and trunks involves joint processes and use of the same facilities. The total fixed factory overhead cost is $2,000,000, and total fixed selling and administrative costs are $840,000. Production and sales are scheduled for 500,000 crates and 700,000 trunks. Lazar has a normal capacity to produce a total of 2,000,000 units in any combination of crates and trunks, and it maintains no direct materials, work-in-process, or finished goods inventory.

[Due to plant renovations, Lazar will be limited to 1,000,000 machine hours. What is the maximum amount of contribution margin Lazar can generate during the renovation period?]

A. $1,500,000
B. $2,000,000
C. $3,000,000
D. $7,000,000

Answer (A) is incorrect because The amount of $1,500,000 is the lower of the two possible contribution margin totals.
Answer (B) is correct. Lazar’s per-unit contribution margin on crates is $3 ($20 – $5 – $8 – $3 – $1), while the margin on trunks is $8 ($30 – $5 – $10 – $5 – $2). Since only 1,000,000 machine hours are available, Lazar can either produce 500,000 crates or 250,000 trunks (1,000,000 ÷ 2 hours per unit vs. 1,000,000 ÷ 4 hours per unit). The total margin on trunks (250,000 × $8 = $2,000,000) is higher than that on crates (500,000 × $3 = $1,500,000).

Answer (C) is incorrect because the amount of $3,000,000 results from multiplying the contribution margin on crates by the total machine hours available instead of the hours actually needed.

Answer (D) is incorrect because the amount of $7,000,000 results from quadrupling the number of hours available.

Lazar can reduce direct material costs for crates by 50% per unit, with no change in direct labor costs. However, it would increase machine-hour production time by 1.5 hours per unit. For crates, variable overhead costs are allocated based on machine hours. What would be the effect on the total contribution margin if this change was implemented?

A. $125,000 increase.
B. $250,000 decrease.
C. $300,000 increase.
D. $1,250,000 increase.

Answer (A) is correct. Before the change, Lazar’s per-unit contribution margin on crates can be calculated as follows:

| Selling price | $20.00 |
| Direct materials | (5.00) |
| Direct labor | (8.00) |
| Variable overhead | (3.00) |
| Variable S&A | (1.00) |
| **Contribution margin** | **$ 3.00** |

If the change is made, Lazar’s direct materials cost will fall to $2.50 per unit ($5.00 × 50%). Since variable overhead is applied on the basis of machine hours, the application rate must be $1.50 per hour ($3 ÷ 2 machine hours per unit). If the change is made, per-unit machine hours will increase to 3.5 (2 + 1.5) and per-unit variable overhead will thus increase to $5.25 ($1.50 × 3.5). Lazar’s per-unit contribution margin on crates after the change can be calculated as follows:

| Selling price | $20.00 |
| Direct materials | (2.50) |
| Direct labor | (8.00) |
| Variable overhead | (5.25) |
| Variable S&A | (1.00) |
| **Contribution margin** | **$ 3.25** |

The difference in the two per-unit amounts ($3.25 – $3.00 = $0.25) multiplied by the product demand level results in an increase in total contribution margin of $125,000 (500,000 × $0.25).

Answer (B) is incorrect because a $250,000 decrease results from doubling the variable overhead rather than adjusting it for the change in machine hours.

Answer (C) is incorrect because a $300,000 increase results from inverting the calculation for labor savings.

Answer (D) is incorrect because a $1,250,000 increase results from failing to adjust variable overhead.
Oakes, Inc., manufactured 40,000 gallons of Mononate and 60,000 gallons of Beracyl in a joint production process, incurring $250,000 of joint costs. Oakes allocates joint costs based on the physical volume of each product produced. Mononate and Beracyl can each be sold at the split-off point in a semifinished state or, alternatively, processed further. Additional data about the two products are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Mononate</th>
<th>Beracyl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price per gallon at split-off</td>
<td>$7</td>
<td>$15</td>
</tr>
<tr>
<td>Sales price per gallon if processed further</td>
<td>$10</td>
<td>$18</td>
</tr>
<tr>
<td>Variable production costs if processed further</td>
<td>$125,000</td>
<td>$115,000</td>
</tr>
</tbody>
</table>

An assistant in the company’s cost accounting department was overheard saying “...that when both joint and separable costs are considered, the firm has no business processing either product beyond the split-off point. The extra revenue is simply not worth the effort.” Which of the following strategies should be recommended for Oakes?

- A. Sell at split-off Sell at split-off
- B. Sell at split-off Process further
- C. Process further Sell at split-off
- D. Process further Process further

**Answer (A) is incorrect because Beracyl should be processed further.**

**Answer (B) is correct.** To determine whether a product is worth processing further, its contribution margin after processing must be calculated. Oakes performs these calculations as shown below. Note that joint costs are sunk and thus not relevant to the decision whether to process further.

<table>
<thead>
<tr>
<th></th>
<th>Mononate</th>
<th>Beracyl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental sales dollars</td>
<td>$3</td>
<td>$3</td>
</tr>
<tr>
<td>Times: units</td>
<td>40,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Incremental revenue</td>
<td>$120,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Less: variable costs</td>
<td>(125,000)</td>
<td>(115,000)</td>
</tr>
<tr>
<td>Change in operating income</td>
<td>$(5,000)</td>
<td>$65,000</td>
</tr>
</tbody>
</table>

Mononate will generate a loss if it is processed further and should therefore be sold at split-off. Beracyl, however, will generate an additional contribution and will thus benefit the company from being processed further.

- Answer (C) is incorrect because Mononate should be sold at split-off and Beracyl should be processed further.
- Answer (D) is incorrect because Mononate should be sold at split-off.
Lark Industries accepted a contract to provide 30,000 units of Product A and 20,000 units of Product B. Lark’s staff developed the following information with regard to meeting this contract.

<table>
<thead>
<tr>
<th>Product</th>
<th>Product</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Selling price</td>
<td>$75</td>
<td>$125</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$30</td>
<td>$48</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine hours required</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Machine hours available</td>
<td>160,000</td>
<td></td>
</tr>
<tr>
<td>Cost if outsourced</td>
<td>$45</td>
<td>$60</td>
</tr>
</tbody>
</table>

Lark’s operations manager has identified the following alternatives. Which alternative should be recommended to Lark’s management?

A. Make 30,000 units of Product A, utilize the remaining capacity to make Product B, and outsource the remainder.
B. Make 25,000 units of Product A, utilize the remaining capacity to make Product B, and outsource the remainder.
C. Make 20,000 units of Product A, utilize the remaining capacity to make Product B, and outsource the remainder.
D. Rent additional capacity of 30,000 machine hours, which will increase fixed costs by $150,000.

- Answer (A) is correct. The profits under each of the four alternatives would be calculated as follows:

<table>
<thead>
<tr>
<th>Rent</th>
<th>30,000</th>
<th>25,000</th>
<th>20,000</th>
<th>Additional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales - A</td>
<td>$2,250,000</td>
<td>$2,250,000</td>
<td>$2,250,000</td>
<td>$2,250,000</td>
</tr>
<tr>
<td>Sales - B</td>
<td>2,500,000</td>
<td>2,500,000</td>
<td>2,500,000</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Total sales</td>
<td>$4,750,000</td>
<td>$4,750,000</td>
<td>$4,750,000</td>
<td>$4,750,000</td>
</tr>
<tr>
<td>Variable cost A</td>
<td>900,000</td>
<td>750,000</td>
<td>600,000</td>
<td>900,000</td>
</tr>
<tr>
<td>Variable cost B</td>
<td>672,000</td>
<td>816,000</td>
<td>960,000</td>
<td>960,000</td>
</tr>
<tr>
<td>Purchase of A</td>
<td>0</td>
<td>225,000</td>
<td>450,000</td>
<td>0</td>
</tr>
<tr>
<td>Purchase of B</td>
<td>360,000</td>
<td>180,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>1,600,000</td>
<td>1,600,000</td>
<td>1,600,000</td>
<td>1,750,000</td>
</tr>
<tr>
<td>Total costs</td>
<td>$3,532,000</td>
<td>$3,571,000</td>
<td>$3,610,000</td>
<td>$3,610,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$1,218,000</td>
<td>$1,179,000</td>
<td>$1,140,000</td>
<td>$1,140,000</td>
</tr>
</tbody>
</table>

Thus, making 30,000 units of Product A produces the greatest profit.

- Answer (B) is incorrect because Making 25,000 units of A is not as profitable as making 30,000 units of A.
- Answer (C) is incorrect because Making 20,000 units of A is not as profitable as making 30,000 units of A.
- Answer (D) is incorrect because Renting additional capacity is not as profitable as making 30,000 units of A.
Aspen Company plans to sell 12,000 units of product XT and 8,000 units of product RP. Aspen has a capacity of 12,000 productive machine hours. The unit cost structure and machine hours required for each product are as follows:

<table>
<thead>
<tr>
<th>Unit costs:</th>
<th>XT</th>
<th>RP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>$37</td>
<td>$24</td>
</tr>
<tr>
<td>Direct labor</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>Machine hours required</td>
<td>1.0</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Aspen can purchase 12,000 units of XT at $60 and/or 8,000 units of RP at $45. Based on the above, which one of the following actions should be recommended to Aspen’s management?

A. Produce XT internally and purchase RP.
B. Produce RP internally and purchase XT.
C. Purchase both XT and RP.
D. Produce both XT and RP.

- **Answer (A) is correct.** Relevant unit cost to product XT is $55 ($37 + $12 + $6) and cost for RP is $40 ($24 + $13 + $3). Only enough machine hours are available to produce one product or the other (XT: 12,000 × 1.0 hour per unit = 12,000 hours, RP: 8,000 units × 1.5 hours per unit = 12,000 hours). Cost to produce XT in-house would be $660,000 (12,000 × $55) and cost to produce RP would be $320,000 (8,000 × $40). Cost to purchase XT from outside would be $720,000 (12,000 × $60) and cost to purchase RP would be $360,000 (8,000 × $45). The possible combination with the lowest cost is to produce XT and purchase RP ($660,000 + $360,000 = $1,020,000).
- **Answer (B) is incorrect because Producing RP and purchasing XT would result in a total cost of $1,040,000.**
- **Answer (C) is incorrect because Purchasing both products would result in a total cost of $1,080,000.**
- **Answer (D) is incorrect because Only enough machine hours are available to produce one product or the other.**

Grapevine Corporation produces two joint products, JP-1 and JP-2, and a single by-product, BP-1, in Department 2 of its manufacturing plant. JP-1 is subsequently transferred to Department 3, where it is refined into a more expensive, higher-priced product, JP-1R, and a by-product known as BP-2. Recently, Santa Fe Company introduced a product that would compete directly with JP-1R, and as a result, Grapevine must re-evaluate its decision to process JP-1 further. The market for JP-1 will not be affected by Santa Fe’s product, and Grapevine plans to continue production of JP-1, even if further processing is terminated. Should this latter action be necessary, Department 3 will be dismantled. Which of the following items should Grapevine consider in its decision to continue or terminate Department 3 operations?

1. The selling price per pound of JP-1.
2. The total hourly direct labor cost in Department 3.
3. Unit marketing and packaging costs for BP-2.
4. Supervisory salaries of Department 3 personnel who will be transferred elsewhere in the plant, if processing is terminated.
5. Department 2 joint cost allocated to JP-1 and transferred to Department 3.

A. 2, 3, 4.
B. 1, 2, 3.
C. 2, 3, 5, 6.
D. 1, 2, 3, 4, 5.

- **Answer (A) is incorrect because The supervisory salaries do not vary between the alternatives.**
Answer (B) is **correct**. If further processing is ended, the selling price of JP-1 will be relevant instead of the price of JP-1R. The cost of direct labor in Department 3 is relevant because it will be saved if further processing is ended. Marketing and packaging costs for BP-2 are relevant because they will be saved if Department 3 is closed.

- Answer (C) is incorrect because the cost of existing JP-1R inventory is sunk.
- Answer (D) is incorrect because Department 2 joint cost will have to be covered under either alternative.

Jones Enterprises manufactures three products: A, B, and C. During the month of May, Jones’ production, costs, and sales data were as follows:

<table>
<thead>
<tr>
<th>Products</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of production</td>
<td>30,000</td>
<td>20,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Further processing costs</td>
<td>--</td>
<td>$60,000</td>
<td>$140,000</td>
</tr>
<tr>
<td>Unit sales price:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At split-off</td>
<td>3.75</td>
<td>5.50</td>
<td>10.25</td>
</tr>
<tr>
<td>After further processing</td>
<td>--</td>
<td>8.00</td>
<td>12.50</td>
</tr>
</tbody>
</table>

Joint production costs to the split-off point will total $480,000. Based on the above information, which one of the following alternatives should be recommended to Jones’ management?

A. Sell both Product B and Product C at the split-off point.
B. Process Product B further but sell Product C at the split-off point.
C. Process Product C further but sell Product B at the split-off point.
D. Process both Products B and C further.

- Answer (A) is incorrect because Product C should be processed further.
- Answer (B) is incorrect because Product B should be sold at split-off and Product C should be processed further.
- Answer (C) is **correct**. Sales revenues for B and C at split-off respectively are $110,000 (20,000 × $5.50) and $715,000 (70,000 × $10.25). Revenues following further processing can be calculated as follows:

<table>
<thead>
<tr>
<th>Products</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price after further processing</td>
<td>$8.00</td>
<td>$12.50</td>
</tr>
<tr>
<td>Times: units</td>
<td>× 20,000</td>
<td>× 70,000</td>
</tr>
<tr>
<td>Gross revenue</td>
<td>$160,000</td>
<td>$875,000</td>
</tr>
<tr>
<td>Less: processing costs</td>
<td>(60,000)</td>
<td>(140,000)</td>
</tr>
<tr>
<td>Total revenue</td>
<td>$100,000</td>
<td>$735,000</td>
</tr>
</tbody>
</table>

Thus, the combination generating the most revenue is to sell B at split-off ($110,000 > $100,000) and process C further ($735,000 > $715,000).

- Answer (D) is incorrect because Product B should be sold at split-off.
Synergy, Inc., produces a component that is popular in many refrigeration systems. Data on three of the five different models of this component are as follows:

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of production</td>
<td>5,000</td>
<td>6,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Manufacturing costs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable direct costs</td>
<td>$10</td>
<td>$24</td>
<td>$20</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>11</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>$26</td>
<td>$54</td>
<td>$52</td>
</tr>
<tr>
<td>Cost if purchased</td>
<td>$21</td>
<td>$42</td>
<td>$39</td>
</tr>
</tbody>
</table>

Synergy applies variable overhead on the basis of machine hours at the rate of $2.50 per hour. Models A and B are manufactured in the Freezer Department, which has a capacity of 28,000 machine processing hours. Which one of the following options should be recommended to Synergy’s management?

A. Purchase all three products in the quantities required.
B. Manufacture all three products in the quantities required.
C. The Freezer Department’s manufacturing plan should include 5,000 units of Model A and 4,500 units of Model B.
D. The Freezer Department’s manufacturing plan should include 2,000 units of Model A and 6,000 units of Model B.

- Answer (A) is incorrect because there is idle capacity in the freezer department that can be profitably used.
- Answer (B) is incorrect because this would exceed the department’s production capacity.
- Answer (C) is correct. The variable costs of producing all of the units of A and 4,500 units of B would be calculated as follows:

  Variable costs of A: \[5,000 \times $15 = $75,000\]
  Variable costs of B: \[4,500 \times $34 = 153,000\]
  Purchase B: \[1,500 \times $42 = 63,000\]
  Purchase C: \[3,000 \times $39 = 117,000\]
  Total \[\$408,000\]

  If Synergy produced 2,000 units of Model A and 6,000 units of Model B, the calculations would be:

  Variable costs of A: \[2,000 \times $15 = $30,000\]
  Variable costs of B: \[6,000 \times $34 = 204,000\]
  Purchase A: \[3,000 \times $21 = 63,000\]
  Purchase C: \[3,000 \times $39 = 117,000\]
  Total \[\$414,000\]

  Therefore, the first option is better than the second option.
  - Answer (D) is incorrect because it is more costly than alternative C.
Ross, Inc., uses a joint process that yields two products, X and Y. Each product can be sold at its split-off point or processed further. All the additional processing costs are variable and can be traced to each product. Joint production costs are $35,000. Other sales and cost data are as follows.

<table>
<thead>
<tr>
<th></th>
<th>Product X</th>
<th>Product Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales value at split-off point</td>
<td>$60,000</td>
<td>$35,000</td>
</tr>
<tr>
<td>Final sales value if processed further</td>
<td>80,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Additional costs beyond split-off</td>
<td>14,000</td>
<td>18,000</td>
</tr>
</tbody>
</table>

Management wants to know whether to sell each product at the split-off point or to process the products further. Which one of the following options should be recommended to management?

A. Sell both products at the split-off point.
B. Sell Product X at split-off and process Product Y further.
C. Process Product X further and sell Product Y at split-off.
D. Process both products further.

- Answer (A) is incorrect because Only Product Y should be sold at the split-off point.
- Answer (B) is incorrect because Processing Product X further is more profitable.
- Answer (C) is correct. This question requires evaluating whether the profit would be higher to sell at the split-off point or to process further:

<table>
<thead>
<tr>
<th></th>
<th>Product X</th>
<th>Product Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales value</td>
<td>$ 80,000</td>
<td>$ 50,000</td>
</tr>
<tr>
<td>Allocated joint costs</td>
<td>(22,105)*</td>
<td>(12,895)**</td>
</tr>
<tr>
<td>Further processing costs</td>
<td>(14,000)</td>
<td>(18,000)</td>
</tr>
<tr>
<td>Profit</td>
<td>$ 43,895</td>
<td>$ 19,105</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Split Off X</th>
<th>Split Off Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales value</td>
<td>$ 60,000</td>
<td>$ 35,000</td>
</tr>
<tr>
<td>Allocated joint costs</td>
<td>21,105*</td>
<td>(12,895)**</td>
</tr>
<tr>
<td>Further processing costs</td>
<td>(14,000)</td>
<td>(18,000)</td>
</tr>
<tr>
<td>Profit</td>
<td>$ 37,895</td>
<td>$ 22,105</td>
</tr>
</tbody>
</table>

*\[($60,000 \div $95,000) \times $35,000]\]

**\[($35,000 \div $90,000) \times $35,000]\]

The profit is higher for Product X after further processing and higher for Y at the split-off point. Accordingly, Ross should process Product X further and sell Product Y at the split-off point.

- Answer (D) is incorrect because It is not profitable to process Product Y further.
Leslie Corporation manufactures classroom desk chairs and tables. In the present market, the company can sell as many units of product as it can manufacture, but it is constrained by its availability of machine-hour capacity. Sales price and cost information for each unit of product are shown below.

<table>
<thead>
<tr>
<th></th>
<th>Desk Chairs</th>
<th>Tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales price</td>
<td>$75</td>
<td>$180</td>
</tr>
<tr>
<td>Variable costs</td>
<td>60</td>
<td>155</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$15</td>
<td>$25</td>
</tr>
</tbody>
</table>

Producing a desk chair requires 1 ½ machine hours; producing a table requires 2 ½ machine hours. Which product, if any, is most profitable given the machine-hour constraints?

A. Desk chairs.
B. Tables.
C. Both products are equally profitable.
D. There is not enough data to identify the most profitable product.

- Answer (A) is incorrect because the desk chair is not more profitable to produce than the table.
- Answer (B) is incorrect because the tables are not more profitable to produce than the desk chairs.
- Answer (C) is correct. According to the theory of constraints, the product that produces the highest contribution margin per hour should be produced until demand is satisfied. The primary constraint is the availability of machine hours. The desk chair has a contribution margin of $10/machine hour ($15 CM ÷ 1.5 machine hours). The table has a contribution margin of $10/machine hour as well ($25 CM ÷ 2.5 machine hours). As both have the same contribution margin per machine hour, both will be equally profitable to produce.
- Answer (D) is incorrect because there is enough data to identify the most profitable product.

Long Lake Golf Course has raised greens fees for a nine-hole game due to an increase in demand.

<table>
<thead>
<tr>
<th></th>
<th>Average Games Played at Previous Rate</th>
<th>Average Games Played at New Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Rate</td>
<td>New Rate</td>
<td></td>
</tr>
<tr>
<td>Regular weekday</td>
<td>$10</td>
<td>$11</td>
</tr>
<tr>
<td>Senior citizen</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Weekend</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

Which one of the following is true?

A. The regular weekday and weekend demand is inelastic.
B. The regular weekday and weekend demand is elastic.
C. The senior citizen demand is elastic, and weekend demand is inelastic.
D. The regular weekday demand is inelastic, and weekend demand is elastic.

- Answer (A) is incorrect because weekday demand is elastic.
- Answer (B) is incorrect because weekend demand is inelastic.
Answer (C) is correct. The price elasticity of demand is the percentage change in quantity demanded divided by the percentage change in price. If the elasticity coefficient is greater than one, demand is elastic. If the coefficient is less than one, demand is inelastic. When the percentage changes are calculated as the change over the range (the arc method), the coefficient for senior citizens indicates that demand is elastic:

\[
E_d = \frac{(150 - 82)}{(150 + 82)} \div \frac{($8 - $6)}{($8 + $6)} \\
= \frac{68}{232} \div \frac{2}{14} \\
= \frac{29.3\%}{14.3\%} \\
= 2.05
\]

The coefficient for weekends indicates that demand is inelastic:

\[
E_d = \frac{(223 - 221)}{(223 + 221)} \div \frac{($20 - $15)}{($20 + $15)} \\
= \frac{2}{444} \div \frac{5}{35} \\
= 0.45\% \div 14.3\% \\
= 0.0315
\]

Answer (D) is incorrect because Weekday demand is elastic, and weekend demand is inelastic.

If the coefficient of elasticity is zero, then the consumer demand for the product is said to be

A. Perfectly inelastic.
B. Perfectly elastic.
C. Unit inelastic.
D. Unit elastic.

Answer (A) is correct. When the coefficient of elasticity (percentage change in demand/change in price) is less than one, demand is inelastic. When the coefficient is zero, the demand is perfectly inelastic.

Answer (B) is incorrect because Demand is perfectly elastic when the coefficient is infinite.

Answer (C) is incorrect because Unitary inelasticity is a meaningless term.

Answer (D) is incorrect because Unitary elasticity exists when the coefficient is exactly one.

Using the arc method, demand is inelastic in which price range of the following demand schedule?

<table>
<thead>
<tr>
<th>Price</th>
<th>Quantity Demanded</th>
</tr>
</thead>
<tbody>
<tr>
<td>$22</td>
<td>100</td>
</tr>
<tr>
<td>18</td>
<td>200</td>
</tr>
<tr>
<td>14</td>
<td>400</td>
</tr>
<tr>
<td>10</td>
<td>600</td>
</tr>
<tr>
<td>6</td>
<td>800</td>
</tr>
</tbody>
</table>

A. From $22 to $18.
B. From $18 to $14.
C. From $14 to $10.
D. From $10 to $6.
Answer (A) is incorrect because Demand is inelastic only when the coefficient of elasticity is less than 1. The coefficient is calculated by dividing the percentage change in quantity demanded by the percentage change in price. The percentage change for both the numerator and denominator is the change over the range (the arc method). When price falls from $22 to $18, the coefficient is 3.333, calculated as follows:

\[
E_d = \frac{[(200 - 100) ÷ (200 + 100)]}{[(22 - 18) ÷ (22 + 18)]} = \frac{(100 ÷ 300)}{(4 ÷ 40)} = 33.3\% ÷ 10.0\% = 3.333
\]

Answer (B) is incorrect because Demand is inelastic only when the coefficient of elasticity is less than 1. The coefficient is calculated by dividing the percentage change in quantity demanded by the percentage change in price. The percentage change for both the numerator and denominator is the change over the range (the arc method). When price falls from $18 to $14, the coefficient is 2.667, calculated as follows:

\[
E_d = \frac{[(400 - 200) ÷ (400 + 200)]}{[(18 - 14) ÷ (18 + 14)]} = \frac{(200 ÷ 600)}{(4 ÷ 32)} = 33.3\% ÷ 12.5\% = 2.667
\]

Answer (C) is incorrect because Demand is inelastic only when the coefficient of elasticity is less than 1. The coefficient is calculated by dividing the percentage change in quantity demanded by the percentage change in price. The percentage change for both the numerator and denominator is the change over the range (the arc method). When price falls from $14 to $10, the coefficient is 1.2, calculated as follows:

\[
E_d = \frac{[(600 - 400) ÷ (600 + 400)]}{[(14 - 10) ÷ (14 + 10)]} = \frac{(200 ÷ 1,000)}{(4 ÷ 24)} = 20.0\% ÷ 16.7\% = 1.2
\]

Answer (D) is correct. Demand is inelastic when the coefficient of elasticity is less than 1. The coefficient is calculated by dividing the percentage change in quantity demanded by the percentage change in price. The percentage change for both the numerator and denominator is the change over the range (the arc method). When price falls from $10 to $6, the coefficient is 0.571, calculated as follows:

\[
E_d = \frac{[(800 - 600) ÷ (800 + 600)]}{[(10 - 6) ÷ (10 + 6)]} = \frac{(200 ÷ 1,400)}{(4 ÷ 16)} = 14.3\% ÷ 25.0\% = 0.571
\]
As the price for a particular product changes, the quantity of the product demanded changes according to the following schedule:

<table>
<thead>
<tr>
<th>Total Quantity Demanded</th>
<th>Price per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>$50</td>
</tr>
<tr>
<td>150</td>
<td>45</td>
</tr>
<tr>
<td>200</td>
<td>40</td>
</tr>
<tr>
<td>225</td>
<td>35</td>
</tr>
<tr>
<td>230</td>
<td>30</td>
</tr>
<tr>
<td>232</td>
<td>25</td>
</tr>
</tbody>
</table>

Using the arc method, the price elasticity of demand for this product when the price decreases from $50 to $45 is

A. 0.20
B. 10.00
C. 0.10
D. 3.80

- Answer (A) is incorrect because the 10% decline in price divided by the 50% change in quantity demanded equals 0.20.
- Answer (B) is incorrect because this figure assumes a 5% change in price. It also does not calculate the change over the sum of the endpoints of the range.
- Answer (C) is incorrect because the percentage change in price is 0.10.
- Answer (D) is correct. The product's price elasticity of demand is measured as the percentage change in quantity demanded divided by the percentage change in price. When price falls from $50 to $45, the coefficient is 3.8, calculated as follows:

\[
E_d = \left(\frac{(150 - 100)}{(150 + 100)}\right) / \left(\frac{($50 - $45)}{($50 + $45)}\right) = \left(\frac{50}{250}\right) / \left(\frac{5}{95}\right) = 20.0% / 5.26% = 3.8
\]

Last week, the quantity of apples demanded fell by 6%. If this was a result of a 10% price increase, what is the price elasticity of demand for apples?

A. 1.67
B. 1.06
C. 0.16
D. 0.60

- Answer (A) is incorrect because the inverse of the elasticity is 1.67.
- Answer (B) is incorrect because adding the 6% quantity decline to 1 results in 1.06.
- Answer (C) is incorrect because the price elasticity of demand is found by dividing the 6% quantity decline by the 10% price increase, not by adding them.
- Answer (D) is correct. The price elasticity of demand is calculated by dividing the percentage change in quantity demanded by the percentage change in price. Thus, the change in quantity of 6% divided by the 10% price increase produces an elasticity of 0.6.
The amount of boysenberries demanded for the third quarter rose from 1,250 units to 1,750 units from last year. This was due to a decrease in price from $1.25 to $0.75 per unit. Therefore, the price elasticity of boysenberries is

A. 1/3  
B. 3/2  
C. 1  
D. 2/3

- Answer (A) is incorrect because the increase in quantity sold is 1/3.
- Answer (B) is incorrect because the inverse of price elasticity is 3/2.
- Answer (C) is incorrect because this figure is based on the original quantity and price rather than the average quantity and price.
- Answer (D) is correct. The price elasticity is calculated by dividing the percentage change in quantity by the percentage change in price. The numerator and denominator are computed as the change over the midpoint range. Thus, the change in quantity of 500 units (1,750 – 1,250) divided by the range of 3,000 (1,750 + 1,250) produces a quantity increase of 1/6. The $.50 price decline divided by the price range of $2 produces a price decline of 25%. Dividing the quantity increase by the price change (1/6 ÷ .25) equals a price elasticity of 2/3.

Suppose the price of mood rings rises from $3 to $4 when the quantity demanded of mood rings decreases from 1,000 to 900. What would be the price elasticity of demand coefficient?

A. 3.00  
B. 2.71  
C. 0.37  
D. 0.33

- Answer (A) is incorrect because the inverse of the price increase divided by the original, not the average, price is 3.00.
- Answer (B) is incorrect because the inverse of the correct coefficient is 2.71.
- Answer (C) is correct. The price elasticity is calculated by dividing the percentage change in quantity demanded by the percentage change in price. The numerator and denominator are both computed as the change over the range. Thus, the change in quantity demanded of 100 units divided by the sum of quantities demanded of 1,900 produces a quantity decrease of 5.263%. The price increase of $1 divided by the sum of the prices of $7 results in a price increase of 14.286%. Dividing 5.263% by 14.286% results in an elasticity coefficient of .3684, or .37 rounded.
- Answer (D) is incorrect because the percentage change in price would be 0.33 if the original, not the average, price was used in the denominator.

In the pharmaceutical industry where a diabetic must have insulin no matter what the cost and where there is no substitute, the diabetic’s demand curve is best described as

A. Perfectly elastic.  
B. Perfectly inelastic.  
C. Relatively elastic.  
D. Relatively inelastic.
Answer (A) is incorrect because Demand is perfectly elastic when there are so many buyers and sellers for a product that none can influence the price. In such a market, all consumers can buy as much as they want as long as they offer the market price, and all suppliers can sell as much as they offer as long as they charge the market price. This is depicted graphically as a horizontal line. It is the opposite condition from that faced by buyers and sellers of diabetes drugs.

Answer (B) is correct. When buyers have such a high need for a given product that they must pay whatever price sellers choose to charge and there are no suitable substitutes, demand is said to be perfectly inelastic. This is depicted graphically as a vertical line.

Answer (C) is incorrect because Relatively elastic demand means that a given percentage change in price will cause a greater percentage change in demand.

Answer (D) is incorrect because The demand for insulin is perfectly inelastic, not merely relatively inelastic.

If a product has a price elasticity of demand of 2.0, the demand is said to be

A. Perfectly elastic.
B. Perfectly inelastic.
C. Relatively elastic.
D. Relatively inelastic.

Answer (A) is incorrect because Demand is perfectly elastic when the coefficient is infinite, meaning buyers can obtain as much of a product as they want for the prevailing price, and suppliers can sell as much as they can bring to the market as long as they charge the prevailing price.

Answer (B) is incorrect because Demand is perfectly inelastic when the coefficient is zero, meaning buyers have such a strong demand for the product that they must pay whatever the prevailing price is, and suppliers can charge any price they want to as long as they only attempt to sell the correct amount of product.

Answer (C) is correct. Elasticity is a measure of the sensitivity of consumer reaction to a change in the price of a good or service. If price elasticity of demand is greater than 1, a certain percentage change in price will result in a greater percentage change in the quantity demanded. In this situation, demand is said to be relatively elastic.

Answer (D) is incorrect because If price elasticity of demand is less than 1, demand is relatively elastic, not inelastic.

When a 5% fall in the price of velcro shoes causes the quantity demanded to increase by 10%, the demand for velcro shoes is said to be

A. Perfectly inelastic.
B. Relatively elastic.
C. Unit elastic.
D. Relatively inelastic.

Answer (A) is incorrect because Perfect inelasticity occurs when the coefficient is zero.

Answer (B) is correct. If the elasticity coefficient is greater than 1, demand is classified as relatively elastic. Since the percentage change in quantity demanded is 10% and the price change is 5%, the elasticity coefficient is 2.0 (10% ÷ 5%).

Answer (C) is incorrect because Unitary elasticity refers to a condition in which the coefficient is equal to 1.

Answer (D) is incorrect because An inelastic condition exists when the coefficient is less than 1.
The graph on the right depicts demand that is more ________________ than the graph on the left.

A. Inelastic.
B. Elastic.
C. Unit elastic.
D. Perfectly inelastic.

- Answer (A) is incorrect because the lower slope of the curve on the right indicates less elasticity.
- Answer (B) is correct. As demand becomes more elastic, the curve approaches the horizontal. When the demand elasticity coefficient is infinite, demand is perfectly elastic (depicted as a horizontal line).
- Answer (C) is incorrect because Unitary elasticity is found at a (usually very) small range of a single demand curve. It is not a condition revealed by comparing two demand curves.
- Answer (D) is incorrect because Perfect inelasticity of demand is depicted by a vertical line. There are no degrees of perfect inelasticity.

If oil producers and retailers were to increase the price of gasoline for cars during the summer season by $.05 per gallon, these suppliers anticipate that the demand for gasoline

A. Is relatively elastic.
B. Is relatively inelastic.
C. Responds as an inferior good.
D. Is perfectly inelastic.

- Answer (A) is incorrect because if demand is price elastic, the quantity demanded will decline by a greater percentage than the percentage price increase.
- Answer (B) is correct. An increase in gasoline prices during the summer implies that demand for gasoline is relatively price inelastic in the short run. That is, the price increase will result in little or no decline in the amount demanded, and total revenues will increase.
- Answer (C) is incorrect because the distinction between inferior and normal goods is based on the effects on quantity demanded of a change in income.
- Answer (D) is incorrect because perfect inelasticity means there would be no decline in demand because of a price increase.
If the price of apples declines and total revenue received by the firm increases, the

A. Demand for apples is elastic.
B. Demand for apples is inelastic.
C. Elasticity of demand for apples is 1.0.
D. Elasticity of demand for apples is less than 1.0.

- Answer (A) is correct. A decline in price accompanied by an increase in total revenue indicates that quantity demanded has increased by a greater percentage than the percentage price decrease. Hence, the price elasticity of demand is greater than 1.0. Demand is elastic when it is greater than 1.0.
- Answer (B) is incorrect because The increase in revenue resulting from the price decrease does not indicate inelasticity.
- Answer (C) is incorrect because Elasticity must be greater than 1.0 if the total revenue increases as the result of a price decrease.
- Answer (D) is incorrect because Total revenues received by the firm decrease if the elasticity is less than 1.0.

If a product’s demand is elastic and there is a decrease in price, the effect will be

A. A decrease in total revenue.
B. No change in total revenue.
C. A decrease in total revenue and the demand curve shifts to the left.
D. An increase in total revenue.

- Answer (A) is incorrect because A price decrease on a product with inelastic demand causes a decrease in total revenue. A price decrease on a product with elastic demand causes an increase in total revenue.
- Answer (B) is incorrect because Unitary elasticity (elasticity = 1.0) results in no change in revenue.
- Answer (C) is incorrect because The demand curve will not shift when price decreases; instead, the equilibrium point will move to a new position on the same curve. A price decrease on a product with elastic demand (elasticity > 1.0) results in an increase in total revenue.
- Answer (D) is correct. The concept of price elasticity is of great practical concern to management accountants because a knowledge of elasticity tells the accountant whether a price change will increase or decrease total revenue. If the demand elasticity is greater than one (i.e., demand for the product is elastic), a price decrease will cause an increase in total revenue because the demand increases by a greater percentage than the price decreases.

Suppose that a stairway manufacturer’s price elasticity of demand was inelastic. If this manufacturer decided to increase the price of its stairways, what should have been the result?

A. Total revenues decreased.
B. Total revenues increased.
C. Total revenues remain unchanged.
D. Total revenues were perfectly inelastic.

- Answer (A) is incorrect because An inelastic demand would lead to increased revenues as prices rise.
- Answer (B) is correct. Inelasticity refers to the condition in which the percentage change in quantity is less than the percentage change in price. If price increased 10%, the quantity demanded would decline by less than 10%. Therefore, total revenues would increase.
- Answer (C) is incorrect because An inelastic demand would lead to increased revenues as prices rise.
Worldwide, Inc., noticed that they were losing business to other firms. In view of this, the company decided to change its monthly charges for its various telephone services as follows:

<table>
<thead>
<tr>
<th>Service</th>
<th>Previous Rate</th>
<th>New Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call waiting</td>
<td>$8</td>
<td>$4</td>
</tr>
<tr>
<td>Caller ID</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>International calling</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Internet access</td>
<td>15</td>
<td>13</td>
</tr>
</tbody>
</table>

In response to these price changes, the demand for the above services changed as follows:

<table>
<thead>
<tr>
<th>Service</th>
<th>Previous Demand</th>
<th>New Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call waiting</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Caller ID</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>International calling</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Internet access</td>
<td>150</td>
<td>160</td>
</tr>
</tbody>
</table>

Using the midpoint method, the price elasticity of demand is the highest for

A. Call waiting.
B. Caller ID.
C. International calling.
D. Internet access.

- Answer (A) is incorrect because the price elasticity of demand for call waiting is only 0.6.
- Answer (B) is correct. Price elasticity of demand measures the responsiveness of demand for a product to a change in price. The coefficient is calculated by dividing the percentage change in quantity demanded by the percentage change in price. The point method uses this formula:

\[
E_d = \frac{|Q_2 - Q_1|}{|P_2 - P_1|} \div \frac{|Q_2 + Q_1|}{|P_2 + P_1|}
\]

By convention, elasticity of demand is reported as a positive number. Thus, the calculation for caller ID is as follows:

\[
E_d = \frac{|70 - 50|}{|$4 - $6|} \div \frac{|120|}{|$2 + $10|} = \frac{20}{20} = 1.000
\]

- Answer (C) is incorrect because the price elasticity of demand for international calling is only 0.286.
- Answer (D) is incorrect because the price elasticity of demand for Internet access is only 0.452.
An economic research firm performed extensive studies on the market for large screen televisions (LSTs). Portions of the results are shown below.

<table>
<thead>
<tr>
<th>Household Income</th>
<th>LST Sales (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50,000</td>
<td>20,000</td>
</tr>
<tr>
<td>60,000</td>
<td>28,000</td>
</tr>
<tr>
<td>72,000</td>
<td>39,200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price of LSTs</th>
<th>LST Sales (units)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,000</td>
<td>100,000</td>
</tr>
<tr>
<td>900</td>
<td>115,000</td>
</tr>
<tr>
<td>810</td>
<td>132,250</td>
</tr>
</tbody>
</table>

The price elasticity of demand for LSTs is

A. 0.67  
B. 1.15  
C. 1.33  
D. 2.00

- Answer (A) is incorrect because The price elasticity of demand is equal to change in quantity demanded divided by change in price.
- Answer (B) is incorrect because This is simply one level of sales divided by another level of sales (115,000 ÷ 100,000).
- Answer (C) is correct. The price elasticity of demand equals the percentage change in quantity demanded divided by the percentage change in price.

Percentage change in quantity demanded: 

\[\frac{(115,000 - 132,250)}{132,250} = .13\]

Percentage change in price: 

\[\frac{($900 - $810)}{$810} = .10\]

Price elasticity of demand = \(.13 ÷ .10 = 1.33\)

- Answer (D) is incorrect because Change in demand is not equal to 20%.
Which one of the graphs depicts the demand curve for prestige goods?

- **Answer (A)** is incorrect because this graph describes the familiar, negatively sloped relation between price charged and the resulting demand level for normal goods.
- **Answer (B)** is incorrect because the demand curve can be linear or curvilinear.
- **Answer (C)** is correct. Over some intermediate range of prices, the reaction to a price increase for prestige goods is an increase, not a decrease, in the quantity demanded. Within this range, the demand curve is upward sloping. The reason is that consumers interpret the higher price to indicate a better or more desirable product. Above some price level, the relation between price and quantity demanded will again become negatively sloped.
- **Answer (D)** is incorrect because this demand curve has the same basic shape as the demand curve for prestige goods, but it bends the wrong way. As prices increase, quantity demanded first falls and then rises in this graph.
Buyer-based pricing involves

A. Adding a standard markup to the cost of the product.
B. Determining the price at which the product will earn a target profit.
C. Basing prices on the product’s perceived value.
D. Basing prices on competitors’ prices.

- Answer (A) is incorrect because adding a standard markup to the cost of the product is cost-plus pricing.
- Answer (B) is incorrect because determining the price at which the product will earn a target profit is target profit pricing.
- Answer (C) is correct. Buyer-based pricing involves basing prices on the product’s perceived value rather than on the seller’s cost. Nonprice variables in the marketing mix augment the perceived value. For example, a cup of coffee may have a higher price at an expensive restaurant than at a fast food outlet.
- Answer (D) is incorrect because basing prices on competitors’ prices is going-rate pricing.

Which of the following price adjustment strategies is designed to stabilize production for the selling firm?

A. Cash discounts.
B. Quantity discounts.
C. Functional discounts.
D. Seasonal discounts.

- Answer (A) is incorrect because cash discounts encourage prompt payment.
- Answer (B) is incorrect because quantity discounts encourage large volume purchases.
- Answer (C) is incorrect because functional or trade discounts are provided to channel members in return for the performance of certain functions, such as selling, storing, and record keeping.
- Answer (D) is correct. Seasonal discounts are designed to smooth production by the selling firm. For example, a ski manufacturer offers seasonal discounts to retailers in the spring and summer to encourage early ordering.

Market-skimming pricing strategies could be appropriate when

A. No buyers want the product at a high price.
B. The costs of producing a small volume are low.
C. Competitors can easily enter the market.
D. The product is of poor quality.

- Answer (A) is incorrect because if no buyers want the product at a high price, this marketing strategy is inappropriate.
- Answer (B) is correct. Market-skimming pricing is used when a new product is introduced at the highest price possible given the benefits of the product. For market skimming to work, the product must appear to be worth its price, the costs of producing a small volume cannot be so high that they eliminate the advantage of charging more, and competitors cannot enter the market and undercut the price.
- Answer (C) is incorrect because if competitors can easily enter the market, they can undercut the price.
- Answer (D) is incorrect because the product quality and image must support a high price.
Which of the following pricing policies involves the selling company setting freight charges to customers at the actual average freight cost?

A. Freight absorption pricing.  
B. Uniform delivered pricing.  
C. Zone pricing.  
D. FOB-origin pricing.

- Answer (A) is incorrect because in freight absorption pricing, the selling company absorbs all or part of the actual freight charges. Customers are not charged actual delivery costs.
- Answer (B) is correct. In uniform delivered pricing, the company charges the same price, inclusive of shipping costs, to all customers regardless of their location. This price is the company’s average actual freight cost. Thus, both nearby and distant customers are charged the same amount. This policy is easy to administer, permits the company to advertise one price nationwide, and facilitates marketing to faraway customers.
- Answer (C) is incorrect because in zone pricing, differential freight charges are set for customers on the basis of their location. Customers are not charged actual average freight costs.
- Answer (D) is incorrect because in FOB-origin pricing, each customer pays its actual freight costs.

In which product-mix pricing strategy is it appropriate for the seller to accept any price that exceeds the storage and delivery costs for the product?

A. By-product pricing.  
B. Optional-product pricing.  
C. Captive-product pricing.  
D. Product-bundle pricing.

- Answer (A) is correct. A by-product is a product of relatively minor importance generated during the production of one or more other products. Its production entails no additional costs. Any amount received above the storage and delivery costs for a by-product allows the seller to reduce the main product’s price to make it more competitive.
- Answer (B) is incorrect because optional products are offered for sale along with the main product. They are unlikely to have a zero production cost, so the seller must receive a price above their storage and delivery costs.
- Answer (C) is incorrect because captive products must be used along with the main product, such as film for use with a camera. Sellers often make their profits on the captive products rather than on the main product, which is sold at a low price. The captive products therefore will be priced well above the storage and delivery costs.
- Answer (D) is incorrect because product bundles are combinations of products sold together at a reduced price, such as season tickets for a theater. Products are bundled to promote the sale of certain items that consumers might not otherwise purchase. The combined price of the bundle must be low enough to encourage consumers to buy the bundle but must recover production costs and provide some profit for the seller, so the price must exceed storage and delivery costs.

Several surveys point out that most managers use full product costs, including unit fixed costs and unit variable costs, in developing cost-based pricing. Which one of the following is least associated with cost-based pricing?

A. Price stability.  
B. Price justification.  
C. Target pricing.  
D. Fixed-cost recovery.

- Answer (A) is incorrect because full-cost pricing promotes price stability. It limits the ability to cut prices.
Answer (B) is incorrect because Full-cost pricing provides evidence that the company is not violating antitrust laws against predatory pricing.

Answer (C) is correct. A target price is the expected market price of a product, given the company’s knowledge of its customers and competitors. Hence, under target pricing, the sales price is known before the product is developed. Subtracting the unit target profit margin determines the long-term unit target cost. If cost-cutting measures do not permit the product to be made at or below the target cost, it will be abandoned.

Answer (D) is incorrect because Full-cost pricing has the advantage of recovering the full long-term costs of the product. In the long term, all costs are relevant.

If a U.S. manufacturer’s price in the U.S. market is below an appropriate measure of costs and the seller has a reasonable prospect of recovering the resulting loss in the future through higher prices or a greater market share, the seller has engaged in

A. Collusive pricing.
B. Dumping.
C. Predatory pricing.
D. Price discrimination.

Answer (A) is incorrect because Collusive pricing involves a conspiracy to set higher prices.

Answer (B) is incorrect because Dumping is defined under U.S. law as sale by a non-U.S. company in the U.S. market of a product below its market value in the country where it was produced. Such sale is illegal if it threatens material injury to a U.S. industry.

Answer (C) is correct. Predatory pricing is intentionally pricing below cost to eliminate competition and reduce supply. Federal statutes and many state laws prohibit the practice. The U.S. Supreme Court has held that pricing is predatory when two conditions are met: (1) The seller’s price is below “an appropriate measure of its costs,” and (2) it has a reasonable prospect of recovering the resulting loss through higher prices or greater market share.

Answer (D) is incorrect because Price discrimination entails charging different prices to different customers for essentially the same product if the effect is to lessen competition substantially; to tend to create a monopoly; or to injure, destroy, or prevent competition.

Which one of the following will not occur in an organization that gives managers throughout the organization maximum freedom to make decisions?

A. Individual managers regarding the managers of other segments as they do external parties.
B. Two divisions of the organization having competing models that aim for the same market segments.
C. Delays in securing approval for the introduction of new products.
D. Greater knowledge of the marketplace and improved service to customers.

Answer (A) is incorrect because When segments are autonomous, other segments are regarded as external parties, e.g., as suppliers, customers, or competitors.

Answer (B) is incorrect because Autonomous segments may have the authority to compete in the same markets.

Answer (C) is correct. Decentralization is beneficial because it creates greater responsiveness to the needs of local customers, suppliers, and employees. Managers at lower levels are more knowledgeable about local markets and the needs of customers, etc. A decentralized organization is also more likely to respond flexibly and quickly to changing conditions, for example, by expediting the introduction of new products. Furthermore, greater authority enhances managerial morale and development. Disadvantages of decentralization include duplication of effort and lack of goal congruence.

Answer (D) is incorrect because Decentralizing decision making results in improved service. The managers closest to customers are making decisions about customer service.
The most fundamental responsibility center affected by the use of market-based transfer prices is a(n)

A. Production center.  
B. Investment center.  
C. Cost center.  
D. Profit center.

- Answer (A) is incorrect because a production center may be a cost center, a profit center, or even an investment center. Transfer prices are not used in a cost center. Transfer prices are used to compute profitability, but a cost center is responsible only for cost control.
- Answer (B) is incorrect because an investment center is not as fundamental as a profit center.
- Answer (C) is incorrect because transfer prices are not used in a cost center.
- Answer (D) is correct. Transfer prices are often used by profit centers and investment centers. Profit centers are the more fundamental of these two centers because investment centers are responsible not only for revenues and costs but also for invested capital.

Transfer pricing should encourage goal congruence and managerial effort. In a decentralized organization, it should also encourage autonomous decision making. Managerial effort is the

A. Desire and the commitment to achieve a specific goal.  
B. Sharing of goals by supervisors and subordinates.  
C. Extent to which individuals have the authority to make decisions.  
D. Extent of the attempt to accomplish a specific goal.

- Answer (A) is incorrect because motivation is the desire and the commitment to achieve a specific goal.
- Answer (B) is incorrect because goal congruence is the sharing of goals by supervisors and subordinates.
- Answer (C) is incorrect because autonomy is the extent to which individuals have the authority to make decisions.
- Answer (D) is correct. Managerial effort is the extent to which a manager attempts to accomplish a goal. Managerial effort may include psychological as well as physical commitment to a goal.

A proposed transfer price may be based upon the outlay cost. Outlay cost plus opportunity cost is the

A. Retail price.  
B. Price representing the cash outflows of the supplying division plus the contribution to the supplying division from an outside sale.  
C. Price usually set by an absorption-costing calculation.  
D. Price set by charging for variable costs plus a lump sum or an additional markup, but less than full markup.

- Answer (A) is incorrect because the retail price is the definition of the market price, assuming an arm's-length transaction.
- Answer (B) is correct. At this price, the supplying division is indifferent as to whether it sells internally or externally. Outlay cost plus opportunity cost therefore represents a minimum acceptable price for a seller. However, no transfer price formula is appropriate in all circumstances.
- Answer (C) is incorrect because full cost is the price usually set by an absorption-costing calculation.
• Answer (D) is incorrect because The variable-cost-plus price is the price set by charging for variable costs plus a lump sum or an additional markup, but less than full markup.

[1314] A proposed transfer price may be a cost-plus price. Variable-cost-plus price is the price

A. On the open market.
B. Representing the cash outflows of the supplying division plus the contribution to the supplying division from an outside sale.
C. Usually set by an absorption-costing calculation.
D. Set by charging for variable costs plus a lump sum or an additional markup, but less than full markup.

• Answer (A) is incorrect because The price on the open market is the definition of the market price.
• Answer (B) is incorrect because Outlay cost plus opportunity cost is the price representing the cash outflows of the supplying division plus the contribution to the supplying division from an outside sale.
• Answer (C) is incorrect because The full-cost price is the price usually set by an absorption-costing calculation.
• Answer (D) is correct. The variable-cost-plus price is the price set by charging for variable cost plus either a lump sum or an additional markup but less than the full markup price. This permits top management to enter the decision process and dictate that a division transfer at variable cost plus some appropriate amount.

[1315] A proposed transfer price may be based upon the full-cost price. Full-cost price is the price

A. On the open market.
B. Representing the cash outflows of the supplying division plus the contribution to the supplying division from an outside sale.
C. Usually set by an absorption-costing calculation.
D. Set by charging for variable costs plus a lump sum or an additional markup, but less than full markup.

• Answer (A) is incorrect because The market price is the price on the open market.
• Answer (B) is incorrect because The outlay cost plus opportunity cost is the price representing the cash outflows of the supplying division plus the contribution to the supplying division from an outside sale.
• Answer (C) is correct. Full-cost price is the price usually set by an absorption-costing calculation and includes materials, labor, and a full allocation of manufacturing O/H. This full-cost price may lead to dysfunctional behavior by the supplying and receiving divisions, e.g., purchasing from outside sources at a slightly lower price that is substantially above the variable costs of internal production.
• Answer (D) is incorrect because The variable-cost-plus price is the price set by charging for variable costs plus a lump sum or an additional markup, but less than full markup.

[1316] A limitation of transfer prices based on actual cost is that they

A. Charge inefficiencies to the department that is transferring the goods.
B. Can lead to suboptimal decisions for the company as a whole.
C. Must be adjusted by some markup.
D. Lack clarity and administrative convenience.

• Answer (A) is incorrect because Inefficiencies are charged to the buying department.
Answer (B) is correct. The optimal transfer price of a selling division should be set at a point that will have the most desirable economic effect on the firm as a whole while at the same time continuing to motivate the management of every division to perform efficiently. Setting the transfer price based on actual costs rather than standard costs would give the selling division little incentive to control costs.

Answer (C) is incorrect because By definition, cost-based transfer prices are not adjusted by some markup.

Answer (D) is incorrect because Cost-based transfer prices provide the advantages of clarity and administrative convenience.

Brent Co. has intracompany service transfers from Division Core, a cost center, to Division Pro, a profit center. Under stable economic conditions, which of the following transfer prices is likely to be most conducive to evaluating whether both divisions have met their responsibilities?

A. Actual cost.
B. Standard variable cost.
C. Actual cost plus markup.
D. Negotiated price.

- Answer (A) is incorrect because Actual cost is not appropriate for a transfer price from a cost center to a profit center.
- Answer (B) is correct. A cost center is responsible for costs only. A profit center is responsible for costs and revenues. Hence, the transfer from the cost center must, by definition, be at a cost-based figure. The transfer should be at standard variable cost so as to isolate any variance resulting from Core’s operations. Assuming fixed costs are not controllable in the short run, the relevant variance is the difference between actual cost and the standard variable cost.
- Answer (C) is incorrect because As a cost center, Core will use cost as a transfer price.
- Answer (D) is incorrect because As a cost center, Core will use cost as a transfer price.

Pazer, Inc., produces portable televisions. Pazer’s product manager proposes to increase the cost structure by adding voice-activated volume/channel controls to the televisions, and also adding three additional repair personnel to deal with products returned due to defects. Are these costs value-added or nonvalue-added?

<table>
<thead>
<tr>
<th>Cost of Voice-Activated Controls</th>
<th>Cost of Additional Repair Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Value-added</td>
<td>Value-added</td>
</tr>
<tr>
<td>B. Value-added</td>
<td>Nonvalue-added</td>
</tr>
<tr>
<td>C. Nonvalue-added</td>
<td>Value-added</td>
</tr>
<tr>
<td>D. Nonvalue-added</td>
<td>Nonvalue-added</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Costs incurred to compensate for poor quality are nonvalue-added costs.
- Answer (B) is correct. The additional cost of the voice-activated controls is a value-added cost because it provides new functionality for the consumer. The cost of additional repair personnel, on the other hand, is nonvalue-added since it is incurred to address deficiencies in quality.
- Answer (C) is incorrect because Costs that provide additional functionality for the customer are considered value-added.
- Answer (D) is incorrect because Costs that provide additional functionality for the customer are considered value-added.
Systematic evaluation of the trade-offs between product functionality and product cost while still satisfying customer needs is the definition of

A. Activity-based management.
B. Theory of constraints.
C. Total quality management.
D. Value engineering.

- Answer (A) is incorrect because Activity-based management (ABM) is the linkage of product costing and continuous improvement.
- Answer (B) is incorrect because The theory of constraints (TOC) is a system to improve human thinking about problems. The basic premise of the theory of constraints as applied to business is that improving any process is best done not by trying to maximize efficiency in every part of the process, but by focusing on the slowest part of the process, called the constraint.
- Answer (C) is incorrect because Total quality management (TQM) is used by management to improve operations throughout the value chain to deliver products and services that exceed customer expectations.
- Answer (D) is correct. Systematic evaluation of the trade-offs between product functionality and product cost while still satisfying customer needs is the definition of value engineering.

Vince, Inc., has developed and patented a new laser disc reading device that will be marketed internationally. Which of the following factors should Vince consider in pricing the device?

I. Quality of the new device
II. Life of the new device
III. Customers’ relative preference for quality compared with price

A. I and II only.
B. I and III only.
C. II and III only.
D. I, II, and III.

- Answer (A) is incorrect because The customers’ preference is also important when determining the price of a product.
- Answer (B) is incorrect because The life of the product should also be considered when pricing a product.
- Answer (C) is incorrect because The quality of a product is important when determining how much to charge for it.
- Answer (D) is correct. Product pricing is a function of consumer demand, competitive factors, and the seller’s cost structure and profit objectives. Thus, the seller must consider the trade-off between the price and quality effects on demand. A better-quality product, for example, one with a relatively long useful life, is more costly to produce and therefore sells for a higher price, which in turn reduces the amount demanded.

The advantages of incorporating full product costs in pricing decisions include all the following except

A. Ease in identifying unit fixed costs with individual products.
B. Full product cost recovery.
C. The promotion of price stability.
D. A pricing formula that meets the cost-benefit test, i.e., simplicity.

- Answer (A) is correct. By their nature, fixed costs are difficult to associate with individual products.
- Answer (B) is incorrect because Full product cost recovery is one of the goals of full-cost pricing.
Answer (C) is incorrect because Price stability is one of the goals of full-cost pricing.
Answer (D) is incorrect because Full-cost pricing makes pricing formulas simpler.

Which one of the following situations best lends itself to a cost-based pricing approach?

A. A paper manufacturer negotiating the price for supplying copy paper to a new mass merchandiser of office products.
B. An industrial equipment fabricator negotiating pricing for one of its standard models with a major steel manufacturer.
C. A computer component manufacturer debating pricing terms with a customer in a new channel of distribution.
D. A computer component manufacturer debating pricing with a new customer for a made-to-order, state-of-the-art application.

- Answer (A) is incorrect because The seller might wish to sell below cost to possibly obtain future business from the new customer.
- Answer (B) is incorrect because A major manufacturer might offer future business opportunities to the seller.
- Answer (C) is incorrect because A new distribution channel might warrant a discount since it may result in future sales.
- Answer (D) is correct. A situation involving a job costing system (i.e., a made-to-order product) would be most conducive to the use of a cost-based pricing approach. The other alternatives involve standard products being sold to new types of customers.

Companies that manufacture made-to-order industrial equipment typically use which one of the following?

A. Cost-based pricing.
B. Market-based pricing.
C. Material-based pricing.
D. Price discrimination.

- Answer (A) is correct. A situation involving a job costing system (i.e., a made-to-order product) would be most conducive to the use of a cost-based pricing approach. The other alternatives involve standard products being sold to new types of customers.
- Answer (B) is incorrect because There is no standard market for made-to-order products.
- Answer (C) is incorrect because All costs must be covered, not just material costs.
- Answer (D) is incorrect because Price discrimination is illegal under the Robinson-Patman Act of 1936.

Adams Corporation’s goal is for operating income to equal 6% of sales. Adams estimates that the highest selling price the market will bear is $115 per unit. Adams expects to sell 100,000 units, expects to incur fixed costs of $3,500,000, and has an effective income tax rate of 40%. To achieve these plans, the target variable cost per unit must be

A. $108.10
B. $73.10
C. $68.50
D. $62.75

- Answer (A) is incorrect because The amount of $108.10 incorrectly ignores the fixed costs per unit.
Answer (B) is correct. A target price is the expected market price for a product or service. Subtracting the unit target operating income in addition to the fixed costs per unit from the target selling price per unit produces the target variable cost per unit.

Target sales = $11,500,000 (100,000 units × $115 per unit)

Target operating income = $690,000 (.06 × $11,500,000)

Target operating income/unit = $6.90 ($690,000 ÷ 100,000 units)

Per unit fixed costs = $35/unit ($3,500,000 ÷ 100,000 units)

Target variable cost = $115 – $35 – $6.9 = $73.10

Answer (C) is incorrect because The amount of $68.50 incorrectly adjusts the target operating income/unit for tax effects.

Answer (D) is incorrect because The amount of $62.75 is not meaningful in this context.

Which one of the following statements best describes characteristics of the growth phase of the product life cycle?

A. There is limited competition, and prices are high.
B. Competition increases, and prices are falling.
C. Competition increases, and prices are high.
D. There is limited competition, and prices are falling.

- Answer (A) is incorrect because Limited competition and high prices characterize the introduction phase of the product life cycle.
- Answer (B) is correct. During the growth stage of the product life cycle, competitors begin entering the market, driving down prices for the product.
- Answer (C) is incorrect because These characterize no portion of the product life cycle. High competition almost always results in low prices.
- Answer (D) is incorrect because These characterize no portion of the product life cycle. Limited competition usually results in higher prices, as consumers have little choice in where to purchase the product.

Which one of the following is not a characteristic of market-based costing?

A. It has a customer-driven external focus.
B. It is used by companies facing stiff competition.
C. It is used by companies facing minimal competition.
D. It starts with a target selling price and target profit.

- Answer (A) is incorrect because This is a characteristic of market-based costing.
- Answer (B) is incorrect because This is a characteristic of market-based costing.
- Answer (C) is correct. Market-based pricing is a strategy used by sellers in competitive markets, in other words, in those markets where there is stiff competition.
- Answer (D) is incorrect because This is a characteristic of market-based costing.
Fulford Company applies the target pricing and costing approach. The following information about costs and revenues of Fulford’s product are available for the year just ended:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit sales</td>
<td>60,000</td>
</tr>
<tr>
<td>Unit selling price</td>
<td>$400</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>13,200,000</td>
</tr>
<tr>
<td>Value-chain operating costs excluding production</td>
<td>7,920,000</td>
</tr>
</tbody>
</table>

Fulford plans to increase unit sales to 80,000 by reducing the product’s unit price to $320. If Fulford desires a unit target operating income of 12%, by what amount must it reduce the full cost per unit?

A. $32.00  
B. $38.40  
C. $70.40  
D. $80.00

Answer (A) is incorrect because this figure equals the current full cost per unit minus the new unit target price.  
Answer (B) is incorrect because this figure is the unit target operating income.  
Answer (C) is correct. Unit target operating income is $38.40 ($320 unit target price × 12%). Hence, the unit target full cost is $281.60 ($320 – $38.40). The current full cost per unit is $352.00 [($13,200,000 COGS + $7,920,000 other value chain operating costs) ÷ 60,000 units sold], so the necessary reduction in the full cost per unit is $70.40 ($352.00 – $281.60).  
Answer (D) is incorrect because this figure equals the change in the unit price.

A company’s product has an expected 4-year life cycle from research, development, and design through its withdrawal from the market. Budgeted costs are

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream costs (R&amp;D, design)</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Manufacturing costs</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Downstream costs (marketing, distribution, customer service)</td>
<td>1,200,000</td>
</tr>
<tr>
<td>After-purchase costs</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

The company plans to produce 200,000 units and price the product at 125% of the whole-life unit cost. Thus, the budgeted unit selling price is

A. $15  
B. $31  
C. $36  
D. $45

Answer (A) is incorrect because the budgeted unit manufacturing cost is $15.  
Answer (B) is incorrect because the budgeted unit life-cycle cost is $31.  
Answer (C) is incorrect because the budgeted unit whole-life cost is $36.  
Answer (D) is correct. Whole-life costs include after-purchase costs (operating, support, repair, and disposal) incurred by customers as well as life-cycle costs (R&D, design, manufacturing, marketing, distribution, and research). Hence, the budgeted unit whole-life cost is $36 [($2,000,000 + $3,000,000 + $1,200,000 + $1,000,000) ÷ 200,000 units], and the budgeted unit selling price is $45 ($36 × 125%).
The Alpha Division of a company, which is operating at capacity, produces and sells 1,000 units of a certain electronic component in a perfectly competitive market. Revenue and cost data are as follows:

Sales $50,000
Variable costs 34,000
Fixed costs 12,000

The minimum transfer price that should be charged to the Beta Division of the same company for each component is

A. $12  
B. $34  
C. $46  
D. $50

Answer (A) is incorrect because Given that Alpha Division has no idle capacity, the transfer price to Beta should be the market price of $50 per unit.
Answer (B) is incorrect because The opportunity cost needs to be included.
Answer (C) is incorrect because The minimum transfer price equals outlay (variable) costs plus opportunity cost, not variable costs plus fixed costs.
Answer (D) is correct. In a perfectly competitive market, market price is ordinarily the appropriate transfer price. Because the market price is objective, using it avoids waste and maximizes efficiency. In a perfectly competitive market, the market price equals the minimum transfer price, which is the sum of outlay cost and opportunity cost. Outlay cost is the variable cost per unit, or $34 ($34,000 ÷ 1,000). Opportunity cost is the contribution margin forgone, or $16 ($50 – $34). Thus, the minimum transfer price is $50 ($34 + $16).

Finn Products, a start-up company, wants to use cost-based pricing for its only product, a unique new video game. Finn expects to sell 10,000 units in the upcoming year. Variable costs will be $65 per unit and annual fixed operating costs (including depreciation) amount to $80,000. Finn’s balance sheet is as follows:

<table>
<thead>
<tr>
<th>Assets</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$100,000</td>
</tr>
<tr>
<td>Plant &amp; equipment</td>
<td>425,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities &amp; Equity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$ 25,000</td>
</tr>
<tr>
<td>Debt</td>
<td>200,000</td>
</tr>
<tr>
<td>Equity</td>
<td>300,000</td>
</tr>
</tbody>
</table>

If Finn wants to earn a 20% return on equity, at what price should it sell the new product?

A. $75.00  
B. $78.60  
C. $79.00  
D. $81.00

Answer (A) is incorrect because Improperly applying the return on equity percentage only to current assets results in $75.00.
Answer (B) is incorrect because the price would have to be $79.

Answer (C) is correct. The net income Finn will require is calculated as follows:

\[
\text{Return on equity} = \frac{\text{Net income}}{\text{Equity}}
\]

\[
\text{Net income} = \text{Equity} \times \text{Return on equity}
\]

\[
= \$300,000 \times 20%
\]

\[
= \$60,000
\]

The necessary selling price can then be derived:

\[
\text{Net income} = [(\text{Selling price} - \text{Variable costs}) \times \text{Units sold}] - \text{Fixed costs}
\]

\[
\text{Selling price} = \frac{(\text{Net income} + \text{Fixed costs} + \text{Variable costs})}{\text{Units sold}}
\]

\[
= \frac{\$60,000 + \$80,000 + \$650,000}{10,000}
\]

\[
= \$790,000 \div 10,000
\]

\[
= \$79 \text{ per unit}
\]

Answer (D) is incorrect because basing the rate of return on fixed assets rather than equity results in $81.00.

Briar Co. signed a government construction contract providing for a formula price of actual cost plus 10%. In addition, Briar was to receive one-half of any savings resulting from the formula price’s being less than the target price of $2.2 million. Briar’s actual costs incurred were $1,920,000. How much should Briar receive from the contract?

A. $2,060,000  
B. $2,112,000  
C. $2,156,000  
D. $2,200,000

Answer (A) is incorrect because actual costs plus 50% of the excess of the target price over actual costs equals $2,060,000.

Answer (B) is incorrect because the amount of $2,112,000 is the formula price.

Answer (C) is correct. The formula price is 110% of actual cost, or $2,112,000 (110% × $1,920,000), a savings of $88,000 on the $2,200,000 target price. Accordingly, Briar should receive $2,156,000 ($2,112,000 + [50% × ($2,200,000 – $2,112,000)]).

Answer (D) is incorrect because the amount of $2,200,000 is the target price.
Edwards Products has just developed a new product with a manufacturing cost of $30. The Marketing Director has identified three marketing approaches for this new product.

**Approach X** Set a selling price of $36 and have the firm’s sales staff sell the product at a 10% commission with no advertising program. Estimated annual sales would be 10,000 units.

**Approach Y** Set a selling price of $38, have the firm’s sales staff sell the product at a 10% commission, and back them up with a $30,000 advertising program. Estimated annual sales would be 12,000 units.

**Approach Z** Rely on wholesalers to handle the product. Edwards would sell the new product to the wholesalers at $32 per unit and incur no selling expenses. Estimated annual sales would be 14,000 units.

Rank the three alternatives in order of net profit, from highest net profit to lowest.

- A. X, Y, Z.
- B. Y, Z, X.
- C. Z, X, Y.
- D. Z, Y, X.

- **Answer (A) is incorrect because Approach Z is more profitable than Approach X.**
- **Answer (B) is incorrect because Approach Y is the least profitable alternative.**
- **Answer (C) is correct.** The estimated net profit of Edwards’ three alternatives can be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$36</td>
<td>$38</td>
<td>$32</td>
</tr>
<tr>
<td>Times: sales units</td>
<td>× 10,000</td>
<td>× 12,000</td>
<td>× 14,000</td>
</tr>
<tr>
<td>Estimated sales</td>
<td>$360,000</td>
<td>$456,000</td>
<td>$448,000</td>
</tr>
<tr>
<td>Less: commissions</td>
<td>(36,000)</td>
<td>(45,600)</td>
<td>0</td>
</tr>
<tr>
<td>Gross sales</td>
<td>$324,000</td>
<td>$410,400</td>
<td>$448,000</td>
</tr>
<tr>
<td>Less: advertising</td>
<td>0</td>
<td>(30,000)</td>
<td>0</td>
</tr>
<tr>
<td>Net sales</td>
<td>$324,000</td>
<td>$380,400</td>
<td>$448,000</td>
</tr>
<tr>
<td>Less: manufacturing cost</td>
<td>(300,000)</td>
<td>(360,000)</td>
<td>(420,000)</td>
</tr>
<tr>
<td>Net profit</td>
<td>$24,000</td>
<td>$20,400</td>
<td>$28,000</td>
</tr>
</tbody>
</table>

- **Answer (D) is incorrect because Approach X is more profitable than Approach Y.**
The Robo Division, a decentralized division of GMT Industries, has been approached to submit a bid for a potential project for the RSP Company. Robo Division has been informed by RSP that they will not consider bids over $8,000,000. Robo Division purchases its materials from the Cross Division of GMT Industries. There would be no additional fixed costs for either the Robo or Cross Divisions. Information regarding this project is as follows:

<table>
<thead>
<tr>
<th>Cross Division</th>
<th>Robo Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Transfer price</td>
<td>3,700,000</td>
</tr>
</tbody>
</table>

If Robo Division submits a bid for $8,000,000, the amount of contribution margin recognized by the Robo Division and GMT Industries, respectively, is:

A. $(500,000) and $(2,000,000).
B. $3,200,000 and $(500,000).
C. $(500,000) and $1,700,000.
D. $3,200,000 and $1,700,000.

- Answer (A) is incorrect because the amount of $(2,000,000) for GMT results from improperly subtracting the transfer price.
- Answer (B) is incorrect because the amounts of $3,200,000 for Robo and $(500,000) for GMT result from improperly subtracting the transfer price from GMT rather than from Robo, and from failing to subtract the Cross Divisions variable costs from GMT.
- Answer (C) is correct. The contribution margins for the Robo Division and GMT Industries can be calculated as follows:

<table>
<thead>
<tr>
<th>Robo</th>
<th>GMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract price</td>
<td>$8,000,000</td>
</tr>
<tr>
<td>Less: variable costs</td>
<td>(4,800,000)</td>
</tr>
<tr>
<td>Less: variable costs</td>
<td>--</td>
</tr>
<tr>
<td>Less: transfer price</td>
<td>(3,700,000)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$(500,000)</td>
</tr>
</tbody>
</table>

- Answer (D) is incorrect because the amount of $3,200,000 for Robo results from failing to subtract the transfer price.

Leader Industries is planning to introduce a new product, DMA. It is expected that 10,000 units of DMA will be sold. The full product cost per unit is $300. Invested capital for this product amounts to $20 million. Leader’s target rate of return on investment is 20%. The markup percentage for this product, based on operating income as a percentage of full product cost, will be:

A. 42.9%
B. 57.1%
C. 133.3%
D. 233.3%

- Answer (A) is incorrect because the ratio of the product costs to the sum of the product costs and the required return is 42.9%.
- Answer (B) is incorrect because the ratio of the required return to the sum of the required return and the product costs is 57.1%.
Answer (C) is correct. Leader’s required return is $4,000,000 ($20,000,000 invested capital × 20%). Full product costs amount to $3,000,000 (10,000 units × $300). The markup percentage on DMA is therefore 133.3% ($4,000,000 ÷ $3,000,000).

Answer (D) is incorrect because The ratio of the sum of the required return and the product costs to the product costs is 233.3%.

[1335]Almelo Manpower, Inc., provides contracted bookkeeping services. Almelo has annual fixed costs of $100,000 and variable costs of $6 per hour. This year the company budgeted 50,000 hours of bookkeeping services. Almelo prices its services at full cost and uses a cost-plus pricing approach. The company developed a billing price of $9 per hour. The company’s markup level would be

A. 12.5%
B. 33.3%
C. 50.0%
D. 66.6%

Answer (A) is correct. Markup is the ratio of per-unit operating income to per-unit cost. The variable cost of a unit is $6 and the fixed cost is $2 ($100,000 total ÷ 50,000 units). Thus, the full cost of a single unit is $8 ($6 + $2), and the operating income is $1 ($9 selling price – $8 cost). Almelo’s markup is therefore 12.5% ($1 ÷ $8).

Answer (B) is incorrect because The ratio of operating income to selling price is 33.3%.

Answer (C) is incorrect because The percentage of 50.0% results from failing to subtract fixed costs.

Answer (D) is incorrect because The ratio of variable cost to selling price is 66.6%.

[1336]Fennell Products is using cost-based pricing to determine the selling price for its new product based on the following information.

Annual volume 25,000 units
Fixed costs $700,000 per year
Variable costs $200 per unit
Plant investment $3,000,000
Working capital $1,000,000
Effective tax rate 40%

The target price that Fennell needs to set for the new product to achieve a 15% after-tax return on investment (ROI) would be

A. $228
B. $238
C. $258
D. $268

Answer (A) is incorrect because The amount of $228 results from simply adding the per-unit variable and fixed costs.

Answer (B) is incorrect because The amount of $238 results from failing to include plant investment in invested capital.

Answer (C) is incorrect because The amount of $258 results from failing to include working capital in invested capital.
Answer (D) is **correct**. A 15% after-tax return on investment requires net income of $600,000 ($4,000,000 × .15). Per-unit net income must therefore be $24 ($600,000 ÷ 25,000 units). Per-unit operating income must be $40 ($24 net income ÷ (1.0 – .40 tax rate)). Per-unit fixed cost in Fennell’s relevant range is $28 ($700,000 ÷ 25,000 units), so per-unit contribution margin must be $68 ($40 + $28). Per-unit variable costs are given as $200, so the selling price necessary to generate the desired return is $268 ($200 + $68).

Organizations face several types of risk in pursuit of their strategic objectives. The risk that the treasury function will fail to adequately reconcile the organization’s bank statements is an example of

A. Hazard risk.
B. Financial risk.
C. Operational risk.
D. Strategic risk.

- Answer (A) is incorrect because Hazard risks are risks that are insurable. Examples include natural disasters, the incapacity or death of senior officers, sabotage, and terrorism.
- Answer (B) is incorrect because Financial risks encompass interest-rate risk, exchange-rate risk, commodity risk, credit risk, liquidity risk, and market risk.
- Answer (C) is correct. Operational risks are the risks related to the enterprise’s ongoing, everyday operations. Operational risk is the risk of loss from inadequate or failed internal processes, people, and systems. These failures can relate to human resources (e.g., inadequate hiring or training practices), business processes (poor internal controls), product failure (customer ill will, lawsuits), occupational safety and health incidents, environmental damage, and business continuity (power outages, natural disasters).
- Answer (D) is incorrect because Strategic risks include global economic risk, political risk, and regulatory risk.

The risk associated with a project will increase in direct proportion to all of the following except the:

A. Duration of the project.
B. Volatility of the cash flows associated with the project.
C. Uncertainty surrounding the impact of Federal regulation on the project.
D. Capital adequacy of the organization.

- Answer (A) is incorrect because Anytime uncertainty increases, risk increases. Thus, as the duration of a project or investment increases, so does the associated risk.
- Answer (B) is incorrect because Anytime uncertainty increases, risk increases. Thus, as the volatility of a project or investment increases, so does the associated risk.
- Answer (C) is incorrect because Anytime uncertainty increases, risk increases.
- Answer (D) is correct. Capital adequacy is a term normally used in connection with financial institutions. A bank must be able to pay those depositors that demand their money on a given day and still be able to make new loans. Capital adequacy can be discussed in terms of solvency (the ability to pay long-term obligations as they mature), liquidity (the ability to pay for day-to-day ongoing operations), reserves (the specific amount a bank must have on hand to pay depositors), or sufficient capital.
One technique for quantitatively assessing the risks faced by an organization is to weight the monetary consequences of a potential event by its probability. The amount by which the maximum potential loss associated with the event exceeds this weighted amount is called the

A. Expected loss.  
B. Unexpected loss.  
C. Minimum expected loss.  
D. Maximum expected loss.

- Answer (A) is incorrect because the expected loss is the weighted amount.  
- Answer (B) is correct. The unexpected loss, also called the maximum possible loss, is the amount of potential loss that exceeds the expected amount.  
- Answer (C) is incorrect because minimum expected loss is not a defined term in the context of risk management.  
- Answer (D) is incorrect because maximum expected loss is a defined term in the context of risk management.

The phrase “self insurance” is often used to mean the same thing as

A. Risk retention.  
B. Risk sharing.  
C. Risk transfer.  
D. Risk reduction.

- Answer (A) is correct. Risk retention is the acceptance of the risk of an activity by the organization. This term is becoming synonymous with the phrase “self insurance.”  
- Answer (B) is incorrect because risk sharing is the offloading of some loss potential to another party. Common examples are the purchase of insurance policies, engaging in hedging operations, and entering into joint ventures. It is synonymous with risk transfer.  
- Answer (C) is incorrect because risk transfer, synonymous with risk sharing, is the offloading of some loss potential to another party. Common examples are the purchase of insurance policies, engaging in hedging operations, and entering into joint ventures.  
- Answer (D) is incorrect because risk reduction (mitigation) is the act of lowering the level of risk associated with an activity. For instance, the risk of systems penetration can be reduced by maintaining a robust information security function within the organization.

A landlord owns an office building in the floodplain of the Mississippi River. The landlord has decided to sell the building to a group of investors. The landlord has adopted a risk strategy of

A. Risk exploitation.  
B. Risk transfer.  
C. Risk avoidance.  
D. Risk reduction.

- Answer (A) is incorrect because risk exploitation is the deliberate courting of risk in order to pursue a high return on investment. The building’s purchasers are engaging in risk exploitation.  
- Answer (B) is incorrect because risk transfer, synonymous with risk sharing, is the offloading of some loss potential to another party. Common examples are the purchase of insurance policies, engaging in hedging operations, and entering into joint ventures.
Answer (C) is correct. Risk avoidance is bringing to an end the activity from which the risk arises. For instance, the risk of having a pipeline sabotaged in an unstable region can be avoided by simply selling the pipeline.

Answer (D) is incorrect because Risk reduction (mitigation) is the act of lowering the level of risk associated with an activity. For instance, the risk of systems penetration can be reduced by maintaining a robust information security function within the organization.

[1342]All of the following are potential benefits of risk management except

A. Lower cost of capital.
B. Efficient allocation of resources.
C. Flexibility in responding to unforeseen circumstances.
D. Reduced inherent risk.

Answer (A) is incorrect because Reassuring investors is one of the benefits of risk management. Corporations with strong risk management functions will probably have a lower cost of capital.

Answer (B) is incorrect because Efficient use of resources is one of the benefits of risk management. Only after risks are identified can resources be directed toward those with the greatest exposure.

Answer (C) is incorrect because Encountering fewer surprises is one of the benefits of risk management. After a comprehensive, organization-wide risk assessment has been performed, the odds of an incident arising that has never been considered are greatly reduced.

Answer (D) is correct. Inherent risk is the risk of an activity that arises from the activity itself. For example, uranium prospecting is inherently riskier than retailing.

[1343]Which one of the following is not considered a key step in the risk management process?

A. Prioritize risks.
B. Reconsider current risks.
C. Formulate risk responses.
D. Assess risks.

Answer (A) is incorrect because Prioritizing risks is step 3. In large and/or complex organizations, top management may appoint an ERM committee to review the risks identified by the various operating units and bring them together in a coherent response plan.

Answer (B) is correct. “Current” risks should not be considered in isolation. A risk management system must take a broad view of the risks facing the organization.

Answer (C) is incorrect because Formulating risk responses is step 4. The ERM committee proposes adequate response strategies.

Answer (D) is incorrect because Assessing risks is step 2. Every risk identified must be assessed as to its probability and potential impact.

[1344]A firm can mitigate the risk of financial loss from the possible on-the-job injury of one of its employees through

A. Hazard insurance.
B. Workers' compensation insurance.
C. Key employee insurance.
D. Liability insurance.
Answer (A) is incorrect because Hazard insurance is the same as homeowner’s or automobile driver’s insurance. It protects the organization against damage caused to its facilities by accident or natural disaster.
Answer (B) is incorrect because Workers’ compensation insurance benefits the injured worker, not the organization.
Answer (C) is incorrect because Key employee insurance benefits the organization only in case of the death of a critical member of upper management.
Answer (D) is correct. Liability insurance provides an organization with financial protection against damage caused to consumers by faulty products or injury to persons suffered on the organization’s premises.

A farmers’ cooperative has a large amount of grain that it has gathered from its members and has stored in silos. Prices for grain are high, but none of the cooperative’s customers is prepared to purchase any for the next 3 months. In order to hedge against an unfavorable change in grain prices over the next 3 months, the cooperative will employ a financial risk management technique known as a

A. Short hedge.
B. Long hedge.
C. Naked option.
D. Interest rate swap.

Answer (A) is correct. An extremely common form of financial risk management is called hedging. Hedging is the process of using offsetting commitments to minimize or avoid the impact of adverse price movements. A person who would like to sell an asset in the future has a long position in the asset because (s)he benefits from a rise in value of the asset. To protect against a decline in value, the owner can enter into a short hedge, i.e., obtain an instrument whose value will rise if the asset’s value falls.
Answer (B) is incorrect because A long hedge is obtained by a party who fears a rise, not a fall, in the value of the underlying asset.
Answer (C) is incorrect because A naked option is one in which the seller of the option does not already possess the underlying asset.
Answer (D) is incorrect because An interest rate swap is a hedging tool for parties who are attempting to smooth a flow of interest payments, not lock in the price of a commodity.

Which one of the following calculations does not employ statistical techniques such as the normal distribution?

A. Cash flow at risk.
B. Earnings distribution.
C. Value at risk.
D. Capital adequacy.

Answer (A) is incorrect because Cash flow at risk is a technique that employs the statistical phenomenon known as the normal distribution (bell curve). The potential cash inflow or outflow resulting from a given occurrence can be determined with statistical precision.
Answer (B) is incorrect because Earnings distributions (in total or on a per-share basis) are applications of statistical techniques. Just as in a value-at-risk plot, the potential returns are plotted on the x-axis and the probabilities on the y-axis.
Answer (C) is incorrect because Value at risk (VaR) is a technique that employs the statistical phenomenon known as the normal distribution (bell curve). The potential gain or loss resulting from a given occurrence can be determined with statistical precision.
Answer (D) is **correct**. Capital adequacy is a term normally used in connection with financial institutions. A bank must be able to pay those depositors that demand their money on a given day and still be able to make new loans. Capital adequacy can be discussed in terms of solvency (the ability to pay long-term obligations as they mature), liquidity (the ability to pay for day-to-day ongoing operations), reserves (the specific amount a bank must have on hand to pay depositors), or sufficient capital.

Which one of the following is **not** a key component of the COSO Framework for enterprise risk management?

A. Information and communication.
B. Internal environment.
C. Risk mapping.
D. Control activities.

- Answer (A) is incorrect because Under the information and communication component, relevant information is identified, captured, and communicated.
- Answer (B) is incorrect because The internal environment sets the basis for how risk and control are viewed and addressed by an entity’s people.
- Answer (C) is **correct**. Risk mapping is a visual tool for depicting relative risks. The probabilities of the identified events can be graphed on one axis and the severity of the consequences on the other. It is not a key component of the COSO framework.
- Answer (D) is incorrect because Control activities are policies and procedures are established and executed to help ensure the risk responses management selects are effectively carried out.

Virtucon Company identifies supply chain risks as part of its enterprise risk management (ERM) process. After identification of this risk, Virtucon wants to determine how much of an impact this risk could have on its objectives. Its risk assessment should focus on

A. Both inherent and residual risk.
B. External but not inherent factors.
C. Only expected events.
D. Residual but not inherent risk.

- Answer (A) is **correct**. Enterprise risk management (ERM) is a process designed to identify potential events that may affect the entity. ERM should focus on inherent and residual risk.
- Answer (B) is incorrect because The company should focus on inherent factors.
- Answer (C) is incorrect because Risk management should also focus on the potential for unexpected events.
- Answer (D) is incorrect because Both residual and inherent risk should be focused on.

At the beginning of the year, a portfolio manager who manages a portfolio with a mean annual return of 8% and annual standard deviation of 25% wants to estimate the worst-case expected loss at an 80% confidence level. The value of the portfolio today is $5 million. Which method would the portfolio manager use to estimate the probable maximum loss that may be incurred at the end of the year?

A. Arbitrage pricing theory.
B. Capital asset pricing model.
C. Covariance.
D. Value-at-risk.
Answer (A) is incorrect because The arbitrage pricing theory (APT) describes the price where a mispriced asset is expected to be. It is not used to estimate probable loss.

Answer (B) is incorrect because The capital asset pricing model is a model that describes the relationship between risk and expected return and is used in the pricing of risky securities. It is not used to estimate probable loss.

Answer (C) is incorrect because Covariance is a measure of the degree to which returns on two risky assets move in tandem. It is not used to estimate probable loss.

Answer (D) is correct. Value-at-risk is a statistical technique used to measure and quantify the level of financial risk within a firm or investment portfolio over a specific time frame.

For a firm engaged in risk management, value-at-risk is defined as the

A. Maximum value a company can lose.
B. Maximum loss within a certain time period at a given level of confidence.
C. Worst possible outcome given the distribution of outcomes.
D. Most likely negative outcome at a given level of confidence.

Answer (A) is incorrect because Value-at-risk (VaR) is not the maximum value a company can lose. This is a very general statement that is not defined by VaR. VaR uses the normal distribution (bell curve) in order to find the potential gain or loss.

Answer (B) is correct. Value-at-risk (VaR) is defined as the maximum loss within a certain time period at a given level of confidence. VaR is a technique that employs the statistical phenomenon known as the normal distribution (bell curve). The potential gain or loss resulting from a given occurrence can be determined with statistical precision.

Answer (C) is incorrect because Value-at-risk (VaR) is not the worst possible outcome given the distribution of outcomes. The maximum possible loss is the amount of potential loss that exceeds the expected amount. This is not defined by VaR.

Answer (D) is incorrect because Value-at-risk (VaR) is not the most likely negative outcome at a given level of confidence. It is the maximum loss within that given level of confidence, not the most likely one to occur.

DRP Insurance Company wants to be “best in class” in terms of enterprise risk management (ERM) implementation. To achieve this goal, the company plans to identify events that affect the implementation of strategy and achievement of objectives. Which of the following best reflects an analysis that would help its identification process?

A. Review of accidents and operational measures.
B. Analysis of default histories and dispersion.
C. Summary of driving records and age.
D. Review of incidents and new market conditions.

Answer (A) is incorrect because Event identification involves identifying potential events from internal or external sources affecting achievement of objectives. It includes distinguishing between events that represent risks, those representing opportunities, and those that may be both. A review of accidents may help the company identify risks and opportunities. However, a review of operational measures would not aid the company in identifying these measures.

Answer (B) is incorrect because Event identification involves identifying potential events from internal or external sources affecting achievement of objectives. It includes distinguishing between events that represent risks, those representing opportunities, and those that may be both. An analysis of default histories and dispersions would not allow the company to identify potential opportunities and risks. This analysis is not a source of events that affect the achievement of the company’s objectives.
Answer (C) is incorrect because Event identification involves identifying potential events from internal or external sources affecting achievement of objectives. It includes distinguishing between events that represent risks, those representing opportunities, and those that may be both. A summary of driving records and age would not allow the company to identify potential opportunities and risks. This summary is not a source of events that affect the achievement of the company’s objectives.

Answer (D) is correct. Event identification involves identifying potential events from internal or external sources affecting achievement of objectives. It includes distinguishing between events that represent risks, those representing opportunities, and those that may be both. A review of incidents and new market conditions would best help the company’s identification process as both of these contain events that will affect the implementation of strategy and achievement of objectives.

All of the following are key components of the COSO Framework for enterprise risk management except

A. Risk retention.
B. Risk response.
C. Risk assessment.
D. Objective setting.

Answer (A) is correct. Risk retention is one possible strategy in response to risk, not a step in the risk management process.

Answer (B) is incorrect because Personnel identify and evaluate possible responses to risks, which include avoiding, accepting, reducing, and sharing risk. Management selects a set of actions to align risks with the entity’s risk tolerances and risk appetite.

Answer (C) is incorrect because Identified risks are analyzed in order to form a basis for determining how they should be managed. Risks are associated with objectives that may be affected.

Answer (D) is incorrect because Objectives must exist before management can identify potential events affecting their achievement.

The relevance of a particular cost to a decision is determined by

A. Riskiness of the decision.
B. Number of decision variables.
C. Amount of the cost.
D. Potential effect on the decision.

Answer (A) is incorrect because The ultimate determinant of relevance is the ability to influence the decision.

Answer (B) is incorrect because The ultimate determinant of relevance is the ability to influence the decision.

Answer (C) is incorrect because The ultimate determinant of relevance is the ability to influence the decision.

Answer (D) is correct. Relevance is the capacity of information to make a difference in a decision by helping users of that information to predict the outcomes of events or to confirm or correct prior expectations. Thus, relevant costs are those expected future costs that vary with the action taken. All other costs are constant and therefore have no effect on the decision.
Of the following decisions, capital budgeting techniques would least likely be used in evaluating the 

A. Acquisition of new aircraft by a cargo company. 
B. Design and implementation of a major advertising program. 
C. Trade for a star quarterback by a football team. 
D. Adoption of a new method of allocating nontraceable costs to product lines. 

- Answer (A) is incorrect because a new aircraft represents a long-term investment in a capital good. 
- Answer (B) is incorrect because a major advertising program is a high cost investment with long-term effects. 
- Answer (C) is incorrect because a star quarterback is a costly asset who is expected to have a substantial effect on the team’s long-term profitability. 
- Answer (D) is correct. Capital budgeting is the process of planning expenditures for investments on which the returns are expected to occur over a period of more than 1 year. Thus, capital budgeting concerns the acquisition or disposal of long-term assets and the financing ramifications of such decisions. The adoption of a new method of allocating nontraceable costs to product lines has no effect on a company’s cash flows, does not concern the acquisition of long-term assets, and is not concerned with financing. Hence, capital budgeting is irrelevant to such a decision.

In equipment-replacement decisions, which one of the following does not affect the decision-making process? 

A. Current disposal price of the old equipment. 
B. Operating costs of the old equipment. 
C. Original fair market value of the old equipment. 
D. Cost of the new equipment. 

- Answer (A) is incorrect because it should be considered when evaluating an equipment-replacement decision. 
- Answer (B) is incorrect because they should be considered when evaluating an equipment-replacement decision. 
- Answer (C) is correct. All relevant costs should be considered when evaluating an equipment-replacement decision. These include the cost of the new equipment, the disposal price of the old equipment, and the operating costs of the old equipment versus the operating costs of the new equipment. The original cost or fair market value of the old equipment is a sunk cost and is irrelevant to future decisions. 
- Answer (D) is incorrect because it should be considered when evaluating an equipment-replacement decision.

The term that refers to costs incurred in the past that are not relevant to a future decision is 

A. Discretionary cost. 
B. Full absorption cost. 
C. Underallocated indirect cost. 
D. Sunk cost. 

- Answer (A) is incorrect because a discretionary cost is characterized by uncertainty about the input-output relationship; advertising and research are examples. 
- Answer (B) is incorrect because full absorption costing includes in production costs materials, labor, and both fixed and variable overhead. 
- Answer (C) is incorrect because underallocated indirect cost is a cost that has not yet been charged to production. 
- Answer (D) is correct. A sunk cost cannot be avoided because it represents an expenditure that has already been made or an irrevocable decision to incur the cost.
Which one of the following statements concerning cash flow determination for capital budgeting purposes is not correct?

A. Tax depreciation must be considered because it affects cash payments for taxes.
B. Book depreciation is relevant because it affects net income.
C. Sunk costs are not incremental flows and should not be included.
D. Net working capital changes should be included in cash flow forecasts.

- Answer (A) is incorrect because it is a true statement relating to capital budgeting.
- Answer (B) is correct. Tax depreciation is relevant to cash flow analysis because it affects the amount of income taxes that must be paid. However, book depreciation is not relevant because it does not affect the amount of cash generated by an investment.
- Answer (C) is incorrect because it is a true statement relating to capital budgeting.
- Answer (D) is incorrect because it is a true statement relating to capital budgeting.

A depreciation tax shield is

A. An after-tax cash outflow.
B. A reduction in income taxes.
C. The cash provided by recording depreciation.
D. The expense caused by depreciation.

- Answer (A) is incorrect because a tax shield is not a cash flow, but a means of reducing outflows for income taxes.
- Answer (B) is correct. A tax shield is something that will protect income against taxation. Thus, a depreciation tax shield is a reduction in income taxes due to a company’s being allowed to deduct depreciation against otherwise taxable income.
- Answer (C) is incorrect because cash is not provided by recording depreciation; the shield is a result of deducting depreciation from taxable revenues.
- Answer (D) is incorrect because depreciation is recognized as an expense even if it has no tax benefit.

Lawson, Inc., is expanding its manufacturing plant, which requires an investment of $4 million in new equipment and plant modifications. Lawson’s sales are expected to increase by $3 million per year as a result of the expansion. Cash investment in current assets averages 30% of sales; accounts payable and other current liabilities are 10% of sales. What is the estimated total investment for this expansion?

A. $3.4 million.
B. $4.3 million.
C. $4.6 million.
D. $5.2 million.

- Answer (A) is incorrect because the amount of $3.4 million deducts the investment in working capital from the cost of equipment.
- Answer (B) is incorrect because the amount of $4.3 million equals $4 million plus 10% of $3 million.
Answer (C) is correct. The investment required includes increases in working capital (e.g., additional receivables and inventories resulting from the acquisition of a new manufacturing plant). The additional working capital is an initial cost of the investment, but one that will be recovered (i.e., it has a salvage value equal to its initial cost). Lawson can use current liabilities to fund assets to the extent of 10% of sales. Thus, the total initial cash outlay will be $4.6 million \(\$4\text{ million} + [(30\% - 10\%) \times 3\text{ million sales}])

Answer (D) is incorrect because The amount of $5.2 million equals $4 million plus 30\% of $4 million.

Kline Corporation is expanding its plant, which requires an investment of $8 million in new equipment. Kline’s sales are expected to increase by $6 million per year as a result of the expansion. Cash investment in current assets averages 30\% of sales, and accounts payable and other current liabilities are 10\% of sales. What is the estimated total cash investment for this expansion?

A. $6.8 million.
B. $8.6 million.
C. $9.2 million.
D. $9.8 million.

Answer (A) is incorrect because The amount of $6.8 million subtracted the net investment in working capital from the cost of the equipment.

Answer (B) is incorrect because The amount of $8.6 million assumes current assets will increase by 10\% of new sales but that current liabilities will not change.

Answer (C) is correct. For capital budgeting purposes, the net investment is the net outlay or cash requirement. This amount includes the cost of the new equipment, minus any cash recovered from the trade or sale of existing assets. The investment required also includes funds to provide for increases in working capital, for example, the additional receivables and inventories resulting from the acquisition of a new manufacturing plant. The investment in working capital is treated as an initial cost of the investment, although it will be recovered at the end of the project (its salvage value equals its initial cost). For Kline, the additional current assets will be 30\% of sales, but current liabilities can be used to fund assets to the extent of 10\% of sales. Thus, the initial investment in working capital will equal 20\% of the $6 million in sales, or $1,200,000. The total initial cash outlay will consist of the $8 million in new equipment plus $1,200,000 in working capital, a total of $9.2 million.

Answer (D) is incorrect because The amount of $9.8 million ignores the financing of incremental current assets with accounts payable.

Regal Industries is replacing a grinder purchased 5 years ago for $15,000 with a new one costing $25,000 cash. The original grinder is being depreciated on a straight-line basis over 15 years to a zero salvage value; Regal will sell this old equipment to a third party for $6,000 cash. The new equipment will be depreciated on a straight-line basis over 10 years to a zero salvage value. Assuming a 40\% marginal tax rate, Regal’s net cash investment at the time of purchase if the old grinder is sold and the new one purchased is

A. $19,000
B. $15,000
C. $17,400
D. $25,000

Answer (A) is incorrect because This figure overlooks the tax savings from the loss on the old machine.

Answer (B) is incorrect because This figure is obtained by deducting the old book value from the purchase price.
Answer (C) is correct. The old machine has a carrying amount of $10,000 [$15,000 cost – 5 ($15,000 cost ÷ 15 years) depreciation]. The loss on the sale is $4,000 ($10,000 – $6,000 cash received), and the tax savings from the loss is $1,600 ($4,000 × 40%). Thus, total inflows are $7,600. The only outflow is the $25,000 purchase price of the new machine. The net cash investment is therefore $17,400 ($25,000 – $7,600).

Answer (D) is incorrect because the net investment is less than $25,000 given sales proceeds from the old machine and the tax savings.

[1362] Garfield, Inc., is considering a 10-year capital investment project with forecasted revenues of $40,000 per year and forecasted cash operating expenses of $29,000 per year. The initial cost of the equipment for the project is $23,000, and Garfield expects to sell the equipment for $9,000 at the end of the tenth year. The equipment will be depreciated over 7 years. The project requires a working capital investment of $7,000 at its inception and another $5,000 at the end of Year 5. Assuming a 40% marginal tax rate, the expected net cash flow from the project in the tenth year is

A. $32,000
B. $24,000
C. $20,000
D. $11,000

Answer (A) is incorrect because the amount of $32,000 omits the $8,000 outflow for income taxes.

Answer (B) is correct. The project will have an $11,000 before-tax cash inflow from operations in the tenth year ($40,000 – $29,000). Also, $9,000 will be generated from the sale of the equipment. The entire $9,000 will be taxable because the basis of the asset was reduced to zero in the 7th year. Thus, taxable income will be $20,000 ($11,000 + $9,000), leaving a net after-tax cash inflow of $12,000 [$20,000 × (1.0 – .4)]. To this $12,000 must be added the $12,000 tied up in working capital ($7,000 + $5,000). The total net cash flow in the 10th year will therefore be $24,000.

Answer (C) is incorrect because Taxes will be $8,000, not $12,000.

Answer (D) is incorrect because the amount of $11,000 is the net operating cash flow.

[Fact Pattern #145]
The Moore Corporation is considering the acquisition of a new machine. The machine can be purchased for $90,000; it will cost $6,000 to transport to Moore’s plant and $9,000 to install. It is estimated that the machine will last 10 years, and it is expected to have an estimated salvage value of $5,000. Over its 10-year life, the machine is expected to produce 2,000 units per year, each with a selling price of $500 and combined material and labor costs of $450 per unit. Federal tax regulations permit machines of this type to be depreciated using the straight-line method over 5 years with no estimated salvage value. Moore has a marginal tax rate of 40%.

What is the net cash outflow at the beginning of the first year that Moore Corporation should use in a capital budgeting analysis?

A. $(85,000)
B. $(90,000)
C. $(96,000)
D. $(105,000)

Answer (A) is incorrect because the amount of $(85,000) erroneously includes salvage value but ignores delivery and installation costs.
Answer (B) is incorrect because the amount of $90,000 ignores the outlays needed for delivery and installation costs, both of which are an integral part of preparing the new asset for use.

Answer (C) is incorrect because the amount of $96,000 fails to include installation costs in the total.

Answer (D) is correct. Initially, the company must invest $105,000 in the machine, consisting of the invoice price of $90,000, the delivery costs of $6,000, and the installation costs of $9,000.

What is the net cash flow for the third year that Moore Corporation should use in a capital budgeting analysis?

A. $68,400  
B. $68,000  
C. $64,200  
D. $79,000

- Answer (A) is correct. The company will receive net cash inflows of $50 per unit ($500 selling price – $450 of variable costs), or a total of $100,000 per year. This amount will be subject to taxation, but, for the first 5 years, there will be a depreciation deduction of $21,000 per year ($105,000 cost divided by 5 years). Therefore, deducting the $21,000 of depreciation expense from the $100,000 of contribution margin will result in taxable income of $79,000. After income taxes of $31,600 ($79,000 × 40%), the net cash flow in the third year is $68,400 ($100,000 – $31,600).
- Answer (B) is incorrect because the amount of $68,000 deducts salvage value when calculating depreciation expense, which is not required by the tax law.
- Answer (C) is incorrect because the amount of $64,200 assumes depreciation is deducted for tax purposes over 10 years rather than 5 years.
- Answer (D) is incorrect because the amount of $79,000 is taxable income.

What is the net cash flow for the tenth year of the project that Moore Corporation should use in a capital budgeting analysis?

A. $100,000  
B. $81,000  
C. $68,400  
D. $63,000

- Answer (A) is incorrect because the amount of $100,000 overlooks the salvage proceeds and the taxes to be paid.
- Answer (B) is incorrect because the amount of $81,000 miscalculates income taxes.
- Answer (C) is incorrect because the amount of $68,400 assumes that depreciation is deducted; it also overlooks the receipt of the salvage proceeds.
- Answer (D) is correct. The company will receive net cash inflows of $50 per unit ($500 selling price – $450 of variable costs), or a total of $100,000 per year. This amount will be subject to taxation, as will the $5,000 gain on sale of the investment, bringing taxable income to $105,000. No depreciation will be deducted in the tenth year because the asset was fully depreciated after 5 years. Because the asset was fully depreciated (book value was zero), the $5,000 salvage value received would be fully taxable. After income taxes of $42,000 ($105,000 × 40%), the net cash flow in the tenth year is $63,000 ($105,000 – $42,000).
Metrejean Industries is analyzing a capital investment proposal for new equipment to produce a product over the next 8 years. At the end of 8 years, the equipment must be removed from the plant and will have a net carrying amount of $0, a tax basis of $150,000, a cost to remove of $80,000, and scrap salvage value of $20,000. Metrejean’s effective tax rate is 40%. What is the appropriate “end-of-life” cash flow related to these items that should be used in the analysis?

A. $90,000
B. $54,000
C. $24,000
D. $(36,000)

- Answer (A) is incorrect because the amount of $90,000 assumes that the loss on disposal is a cash inflow. It also ignores income taxes.
- Answer (B) is incorrect because the amount of $54,000 assumes that the loss on disposal involves a cash inflow.
- Answer (C) is correct. The tax basis of $150,000 and the $80,000 cost to remove are deductible expenses, but the $20,000 scrap value is an offsetting cash inflow. Thus, the taxable loss is $210,000 ($150,000 + $80,000 – $20,000). At a 40% tax rate, the $210,000 loss will produce a tax savings (inflow) of $84,000. Accordingly, the final cash flows will consist of an outflow of $80,000 (cost to remove) and inflows of $20,000 (scrap) and $84,000 (tax savings), a net inflow of $24,000.
- Answer (D) is incorrect because the amount of $(36,000) assumes that the tax basis is $0.

Kore Industries is analyzing a capital investment proposal for new equipment to produce a product over the next 8 years. The analyst is attempting to determine the appropriate “end-of-life” cash flows for the analysis. At the end of 8 years, the equipment must be removed from the plant and will have a net book value of zero, a tax basis of $75,000, a cost to remove of $40,000, and scrap salvage value of $10,000. Kore’s effective tax rate is 40%. What is the appropriate “end-of-life” cash flow related to these items that should be used in the analysis?

A. $45,000
B. $27,000
C. $12,000
D. $(18,000)

- Answer (A) is incorrect because the amount of $45,000 ignores income taxes and assumes that the loss on disposal involves a cash inflow.
- Answer (B) is incorrect because the amount of $27,000 assumes that the loss on disposal involves a cash inflow.
- Answer (C) is correct. The tax basis of $75,000 and the $40,000 cost to remove can be written off. However, the $10,000 scrap value is a cash inflow. Thus, the taxable loss is $105,000 ($75,000 loss on disposal + $40,000 expense to remove – $10,000 of inflows). At a 40% tax rate, the $105,000 loss will produce a tax savings (inflow) of $42,000. The final cash flows will consist of an outflow of $40,000 (cost to remove) and inflows of $10,000 (scrap) and $42,000 (tax savings), or a net inflow of $12,000.
- Answer (D) is incorrect because the amount of $(18,000) ignores the tax loss on disposal.
[Fact Pattern #146]
The Dickins Corporation is considering the acquisition of a new machine at a cost of $180,000. Transporting the machine to Dickins’ plant will cost $12,000. Installing the machine will cost an additional $18,000. It has a 10-year life and is expected to have a salvage value of $10,000. Furthermore, the machine is expected to produce 4,000 units per year with a selling price of $500 and combined direct materials and direct labor costs of $450 per unit. Federal tax regulations permit machines of this type to be depreciated using the straight-line method over 5 years with no estimated salvage value. Dickins has a marginal tax rate of 40%.

[1368] (Refers to Fact Pattern #146)
What is the net cash outflow at the beginning of the first year that Dickins should use in a capital budgeting analysis?

A. $(170,000)  
B. $(180,000)  
C. $(192,000)  
D. $(210,000)  

- Answer (A) is incorrect because the amount of $(170,000) includes salvage value and ignores delivery and installation costs.
- Answer (B) is incorrect because the amount of $(180,000) ignores the outlays needed for delivery and installation.
- Answer (C) is incorrect because the amount of $(192,000) excludes installation costs.
- Answer (D) is correct. Delivery and installation costs are essential to preparing the machine for its intended use. Thus, the company must initially pay $210,000 for the machine, consisting of the invoice price of $180,000, the delivery costs of $12,000, and the $18,000 of installation costs.

[1369] (Refers to Fact Pattern #146)
What is the net cash flow for the third year that Dickins should use in a capital budgeting analysis?

A. $136,800  
B. $136,000  
C. $128,400  
D. $107,400  

- Answer (A) is correct. The annual operating cash flows for a capital project consists of two components: the after-tax cash inflows from operations and the depreciation tax shield arising from the purchase of new equipment. The first of these for Dickens can be calculated as follows:

\[
\text{Net annual operating revenue} = (4,000 \times (500 - 450)) = 200,000  
\text{Less: income tax expense} = (200,000 \times 40\%) = 80,000  
\text{After-tax cash inflow from operations} = 120,000
\]

The depreciation tax shield is derived as follows:

\[
\text{Cost of new equipment} = 180,000 + 12,000 + 18,000 = 210,000  
\text{Divided by: estimated useful life} = 5  
\text{Annual depreciation expense} = 42,000  
\text{Times: tax rate} = \times 40\%  
\text{Annual depreciation tax shield} = 16,800
\]

Dickins’s total incremental after-tax operating cash flows for each year of the project’s life is thus $136,800 ($120,000 + $16,800).
Answer (B) is incorrect because the amount of $136,000 results from subtracting salvage value when calculating depreciation expense. Answer (C) is incorrect because the amount of $128,400 assumes depreciation is recognized over 10 years. Answer (D) is incorrect because the amount of $107,400 assumes that depreciation is recognized over 10 years and that it requires a cash outlay.

[1370] (Refers to Fact Pattern #146)

What is the net cash flow for the tenth year of the project that Dickins should use in a capital budgeting analysis?

A. $200,000  
B. $158,000  
C. $136,800  
D. $126,000  

- Answer (A) is incorrect because the amount of $200,000 overlooks the salvage proceeds and the taxes to be paid.  
- Answer (B) is incorrect because the amount of $158,000 equals annual taxable income for each of the first 5 years.  
- Answer (C) is incorrect because the amount of $136,800 is the annual net cash inflow in the second through the fifth years.  
- Answer (D) is correct. The company will receive net cash inflows of $50 per unit ($500 selling price – $450 of variable costs), a total of $200,000 per year for 4,000 units. This amount will be subject to taxation, as will the $10,000 gain on sale of the investment, resulting in taxable income of $210,000. No depreciation will be deducted in the tenth year because the asset was fully depreciated after 5 years. At 40%, the tax on $210,000 is $84,000. After subtracting $84,000 of tax expense from the $210,000 of inflows, the net inflows amount to $126,000.

[Fact Pattern #147]

On January 1, Crane Company will acquire a new asset that costs $400,000 and is anticipated to have a salvage value of $30,000 at the end of 4 years. The new asset

- Qualifies as 3-year property under the Modified Accelerated Cost Recovery System (MACRS).  
- Will replace an old asset that currently has a tax basis of $80,000 and can be sold now for $60,000.  
- Will continue to generate the same operating revenues as the old asset ($200,000 per year). However, savings in operating costs will be experienced as follows: a total of $120,000 in each of the first 3 years and $90,000 in the fourth year.

Crane is subject to a 40% tax rate and rounds all computations to the nearest dollar. Assume that any gain or loss affects the taxes paid at the end of the year in which it occurred. The company uses the net present value method to analyze projects using the following factors and rates:

<table>
<thead>
<tr>
<th>Period</th>
<th>Present Value of $1 at 14%</th>
<th>Present Value of $1 Annuity at 14%</th>
<th>MACRS</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>.88</td>
<td>.88</td>
<td>33%</td>
</tr>
<tr>
<td>2</td>
<td>.77</td>
<td>1.65</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
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<td>2.33</td>
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<tr>
<td>4</td>
<td>.59</td>
<td>2.92</td>
<td>7</td>
</tr>
</tbody>
</table>

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The present value of the depreciation tax shield for the fourth year MACRS depreciation of Crane Company’s new asset is

A. $0  
B. $6,112  
C. $6,608  
D. $16,520

- Answer (A) is incorrect because the depreciation tax shield in Year 4 does have a present value. 
- Answer (B) is incorrect because the amount of $6,112 is calculated by using the cost of the asset less the salvage value to figure MACRS depreciation. 
- Answer (C) is correct. The firm will be able to deduct 7% of the asset’s cost during the fourth year of the asset’s life. The deduction is $28,000 ($400,000 x 7%), and the tax savings is $11,200 ($28,000 x 40%). The present value of this amount is $6,608 ($11,200 x .59 PV of $1 at 14% for four periods). 
- Answer (D) is incorrect because the amount of $16,520 is the present value of the depreciation in Year 4.

The discounted net-of-tax amount that should be factored into Crane Company’s analysis for the disposal transaction is

A. $45,760  
B. $60,000  
C. $67,040  
D. $68,000

- Answer (A) is incorrect because the amount of $45,760 is the present value of the cash from the sale of the old asset minus the tax savings from the loss on disposal. 
- Answer (B) is incorrect because the amount of $60,000 does not include the tax effect of the loss on disposal of the old asset. 
- Answer (C) is correct. The old asset can be sold for $60,000, producing an immediate cash inflow of that amount. This sale will result in a $20,000 loss for tax purposes ($80,000 – $60,000). At a 40% tax rate, the loss, which is deemed to affect taxes paid at the end of the first year, will provide a tax savings (cash inflow) of $8,000. Because the $8,000 savings is treated as occurring at the end of the first year, it must be discounted. This discounted (present) value is $7,040 ($8,000 x .88 PV of $1 at 14% for one period). Combining the $60,000 initial inflow with the $7,040 of tax savings results in a net-of-tax amount of $67,040. 
- Answer (D) is incorrect because the amount of $68,000 does not discount the tax savings. Because the $8,000 savings is treated as occurring at the end of the first year, it must be discounted.

The accounting rate of return

A. Is synonymous with the internal rate of return.  
B. Focuses on income as opposed to cash flows.  
C. Is inconsistent with the divisional performance measure known as return on investment.  
D. Recognizes the time value of money.

- Answer (A) is incorrect because the IRR is the rate at which the net present value is zero. Thus, it incorporates time value of money concepts, whereas the accounting rate of return does not.
Answer (B) is correct. The accounting rate of return (also called the unadjusted rate of return or book value rate of return) is calculated by dividing the increase in accounting net income by the required investment. Sometimes the denominator is the average investment rather than the initial investment. This method ignores the time value of money and focuses on income as opposed to cash flows.

Answer (C) is incorrect because the accounting rate of return is similar to the divisional performance measure of return on investment.

Answer (D) is incorrect because the accounting rate of return ignores the time value of money.

What is a challenge that the long-term aspect of capital budgeting presents to the management accountant?

A. Activity can be tracked for a single accounting period.
B. Capital projects affect multiple accounting periods.
C. The flexibility of the capital budgeting decision.
D. Freedom of the organization's financial planning.

Answer (A) is incorrect because capital budgeting activity affects multiple accounting periods.

Answer (B) is correct. Capital budgeting is the process of planning and controlling investments for long-term projects. It is this long-term aspect of capital budgeting that presents the management accountant with specific challenges. Most financial and management accounting topics concern tracking and reporting activity for a single accounting or reporting cycle, such as one month or one year. By their nature, capital projects affect multiple accounting periods and will constrain the organization’s financial planning well into the future. Once made, capital budgeting decisions tend to be relatively inflexible.

Answer (C) is incorrect because once made, capital budgeting decisions tend to be relatively inflexible.

Answer (D) is incorrect because capital projects will constrain the organization’s financial planning well into the future.

Which of the following is not a category of relevant cash flows?

A. Annual net cash flows.
B. Project termination cash flows.
C. Incremental cash flows.
D. Net initial investment.

Answer (A) is incorrect because annual net cash flows are a category of relevant cash flows.

Answer (B) is incorrect because project termination cash flows are a category of relevant cash flows.

Answer (C) is correct. Relevant cash flows are a much more reliable guide when judging capital projects, since only they provide a true measure of a project’s potential to affect shareholder value. The relevant cash flows can be divided into three categories: (1) net initial investment, (2) annual net cash flows, and (3) project termination cash flows. An incremental cash flow is the difference in cash received or disbursed resulting from selecting one option instead of another. It is not a category of relevant cash flows.

Answer (D) is incorrect because net initial investment is a category of relevant cash flows.
The capital budgeting process contains several stages. At which stage are financial and nonfinancial factors addressed?

A. Identification and definition.
B. Selection.
C. Search.
D. Information-acquisition.

- Answer (A) is incorrect because the identification and definition stage involves identifying and defining those projects and programs that are needed to attain the entity’s objectives.
- Answer (B) is incorrect because during the selection stage, the project(s) that will increase shareholder value by the greatest margin are chosen for implementation.
- Answer (C) is incorrect because potential investments are subjected to a preliminary evaluation by representatives from each function in the entity’s value chain during the search stage of the capital budgeting process.
- Answer (D) is correct. During the information-acquisition stage of the capital budgeting process, quantitative financial factors are given the most scrutiny. These include initial investment and periodic cash inflow. Nonfinancial measures, both quantitative and qualitative, are also identified and addressed. Examples include the need for additional training on new equipment and uncertainty about technological developments and competitors’ actions.

Book rate of return is an unsatisfactory guide to selecting capital projects because

I. It uses accrual accounting numbers.
II. It compares a single project against the average of all capital projects.
III. It uses cash flows to gauge the desirability of the project.

A. I only.
B. I & II.
C. III only.
D. I, II, & III.

- Answer (A) is incorrect because the comparison of a single project’s book rate of return against an average of all of a firm’s capital projects is also a reason that book rate of return is an unsatisfactory guide.
- Answer (B) is correct. A common misstep in regard to capital budgeting is the temptation to gauge the desirability of a project by using accrual accounting numbers instead of cash flows. Net income and book value are affected by the company’s choices of accounting methods. A project’s true rate of return cannot be dependent on bookkeeping decisions. Another distortion inherent in comparing a single project’s book rate of return to the current one for the company as a whole is that the latter is an average of all of a firm’s capital projects. Embedded in that average number may be a handful of good projects making up for a large number of poor investments.
- Answer (C) is incorrect because the book rate of return does not use cash flows in determining the desirability of a capital project.
- Answer (D) is incorrect because book rate of return does not utilize cash flows in the determination.

The maximum benefit forgone by using a scarce resource for a given purpose and not for the next-best alternative is called

A. Opportunity cost.
B. Sunk cost.
C. Incremental cash flow.
D. Net initial investment.
Answer (A) is correct. An opportunity cost is the maximum benefit forgone by using a scarce resource for a given purpose and not for the next-best alternative. In capital budgeting, the most basic application of this concept is the desire to place the company's limited funds in the most promising capital project(s).

Answer (B) is incorrect because a sunk cost is one that is either already paid or irrevocably committed to incur. Because it is unavoidable and will therefore not vary with the option chosen, it is not relevant to future decisions.

Answer (C) is incorrect because an incremental cash flow is the difference in cash received or disbursed resulting from selecting one option instead of another.

Answer (D) is incorrect because net initial investment is one of the three categories of relevant cash flows.

[1379] Post-investment audits

A. Complete a stage in the capital budgeting process.
B. Serve as a control mechanism.
C. Allow the outcome of a project to be evaluated as soon as possible.
D. Deter managers from proposing profitable investments.

Answer (A) is incorrect because post-investment audits are not a stage in the capital budgeting process.
Answer (B) is correct. Post-investment audits should be conducted to serve as a control mechanism and to deter managers from proposing unprofitable investments. Actual-to-expected cash flow comparisons should be made, and unfavorable variances should be explained. Individuals who supplied unrealistic estimates should have to explain differences.
Answer (C) is incorrect because the temptation to evaluate the outcome of a project too early must be overcome. Until all cash flows are known, the results can be misleading. Post-investment audits can reduce this possibility.
Answer (D) is incorrect because the post-investment audits deter managers from proposing unprofitable investments.

[Fact Pattern #148]
Calamity Cauliflower Corporation is considering undertaking a capital project.

The company would have to commit $24,000 of working capital in addition to an immediate outlay of $160,000 for new equipment. The project is expected to generate $100,000 of annual income for 10 years. At the end of that time, the new equipment, which will be depreciated on a straight-line basis, is expected to have a salvage value of $10,000. The existing equipment that would be sold to make room for the project has a historical cost of $220,000 and accumulated depreciation of $208,000. It has an estimated remaining useful life of 2 years and the remaining carrying amount is being depreciated on a straight-line basis. A scrap dealer has agreed to buy it for $8,000.

The company’s effective tax rate is 40%.

[1380] Refers to Fact Pattern #148

Calamity Cauliflower’s tax benefit arising from the disposal of the old equipment is

A. $8,000
B. $4,800
C. $3,200
D. $1,600

Answer (A) is incorrect because the amount of $8,000 is the proceeds from the disposal.
Answer (B) is incorrect because the amount of $4,800 results from improperly multiplying the old equipment’s tax value by the tax rate.

Answer (C) is incorrect because the amount of $3,200 results from improperly multiplying the disposal proceeds by the tax rate.

Answer (D) is correct. A firm enjoys a tax benefit upon recognizing a loss on disposal because the loss reduces taxable income. The old equipment’s tax value is historical cost ($220,000) minus accumulated depreciation ($208,000).

<table>
<thead>
<tr>
<th>Disposal value</th>
<th>$ 8,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: tax value</td>
<td>(12,000)</td>
</tr>
<tr>
<td>Tax-basis loss on disposal</td>
<td>$(4,000)</td>
</tr>
</tbody>
</table>

The tax benefit is the tax-basis loss on the disposal times the effective tax rate.

<table>
<thead>
<tr>
<th>Tax-basis loss on disposal</th>
<th>$4,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times: tax rate</td>
<td>× 40%</td>
</tr>
<tr>
<td>Tax benefit from disposal</td>
<td>$1,600</td>
</tr>
</tbody>
</table>

[1381] (Refers to Fact Pattern #148)

The total after-tax cash inflow relevant to Calamity Cauliflower’s disposal of the old equipment is

A. $9,600  
B. $8,000  
C. $6,400  
D. $1,600

Answer (A) is correct. The relevant after-tax cash inflow consists of the proceeds on the disposal ($8,000) plus the tax benefit ($1,600), calculated as follows: The old equipment’s tax value is historical cost ($220,000) minus accumulated depreciation ($208,000).

<table>
<thead>
<tr>
<th>Disposal value</th>
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</tr>
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<tbody>
<tr>
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</tr>
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<td>Tax-basis loss on disposal</td>
<td>$(4,000)</td>
</tr>
</tbody>
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The tax benefit is the tax-basis loss on the disposal times the effective tax rate.

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<tbody>
<tr>
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<td>× 40%</td>
</tr>
<tr>
<td>Tax benefit from disposal</td>
<td>$1,600</td>
</tr>
</tbody>
</table>

Answer (B) is incorrect because the amount of $8,000 incorrectly omits the tax benefit.

Answer (C) is incorrect because the amount of $6,400 results from improperly subtracting the tax benefit from the disposal proceeds.

Answer (D) is incorrect because the amount of $1,600 improperly omits the proceeds from the disposal.
The net initial investment required for Calamity Cauliflower to undertake this capital project is $184,000 A. $176,000 B. $174,400 C. $160,000 D. $160,000

- Answer (A) is incorrect because The amount of $184,000 improperly omits the after-tax cash flow from the disposal of the old equipment.
- Answer (B) is incorrect because The amount of $176,000 results from improperly subtracting the disposal value of the old equipment.
- Answer (C) is correct. The net initial investment consists of the initial outlay for new equipment ($160,000) plus the increase to working capital ($24,000) minus the net after-tax cash flow from the disposal of the old equipment ($9,600).
- Answer (D) is incorrect because The amount of $160,000 includes only the outlay for the new equipment.

Calamity Cauliflower’s relevant after-tax annual cash inflow from the ongoing operations of the project is $100,000 A. $60,000 B. $40,000 C. $0 D. $0

- Answer (A) is incorrect because The amount of $100,000 fails to take income tax expense into account.
- Answer (B) is correct. The relevant after-tax annual cash inflow for the project consists of the gross cash inflow ($100,000) minus income tax expense ($100,000 × .40), or $60,000.
- Answer (C) is incorrect because The amount of $40,000 is the expected annual income tax expense.
- Answer (D) is incorrect because The company does have a relevant after-tax cash inflow.

Calamity Cauliflower’s expected additional depreciation tax shield for the first year of the project is $10,000 A. $6,400 B. $4,000 C. $2,400 D. $2,400

- Answer (A) is incorrect because The amount of $10,000 results from failing to take income tax expense into account.
- Answer (B) is incorrect because The amount of $6,400 results from failing to take the depreciation savings from disposing of the old equipment into account.
- Answer (C) is correct. The new equipment ($160,000 historical cost) has an estimated 10-year useful life, so annual depreciation expense is expected to be $16,000. (NOTE: When calculating depreciation expense for the depreciation tax shield, salvage value is not deducted.) The old equipment has a book value of $12,000 ($220,000 historical cost – $208,000 accumulated depreciation) being depreciated on a straight-line basis over the remaining useful life of 2 years results in $6,000 depreciation expense for the next 2 years. The additional depreciation tax shield for the first year is thus the difference in the two depreciation expense amounts times the tax rate [(16,000 – 6,000) × .40 = $4,000].
● Answer (D) is incorrect because the amount of $2,400 is only the annual depreciation savings from disposing of the old equipment.

[1385]: (Refers to Fact Pattern #148)
Calamity Cauliflower’s expected depreciation tax shield for the final year of the project is

A. $6,400
B. $4,000
C. $2,400
D. $0

● Answer (A) is correct. The old equipment has a remaining useful life of two years, after which it will be fully depreciated and no longer generating depreciation expense. Thus, the depreciation tax shield in the project’s last year consists only of the annual depreciation expense on the new equipment ($160,000 historical cost ÷ 10 years = $16,000) times the tax rate (.40), or $6,400.

● Answer (B) is incorrect because the amount of $4,000 is the additional depreciation tax shield for the first two years of the project.

● Answer (C) is incorrect because the amount of $2,400 is only the annual depreciation savings from disposing of the old equipment.

● Answer (D) is incorrect because the company will have a depreciation tax shield every year of the project.

[1386]: (Refers to Fact Pattern #148)
If the project is accepted, Calamity Cauliflower’s expected net cash inflow at the end of the first year is

A. $110,000
B. $64,000
C. $60,000
D. $56,000

● Answer (A) is incorrect because the amount of $110,000 results from failing to take income taxes into account.

● Answer (B) is correct. The annual expected net cash inflow from a capital project consists of the after-tax cash inflow from operations [([$100,000 gross cash inflow – ($100,000 × .40) income tax expense] = $60,000] plus the depreciation tax shield [(($16,000 annual depreciation expense on new equipment – $6,000 annual depreciation expense on old equipment) × .40 = $4,000), or $64,000.

● Answer (C) is incorrect because the amount of $60,000 results from failing to take the depreciation tax shield into account.

● Answer (D) is incorrect because the amount of $56,000 results from improperly adding rather than subtracting the depreciation tax shield.

[1387]: (Refers to Fact Pattern #148)
Calamity Cauliflower’s expected total cash inflow in the final year of the project is

A. $100,400
B. $96,400
C. $90,000
D. $72,400
Answer (A) is incorrect because the amount of $100,400 results from failing to take the effect of taxes on the salvage value of the new equipment into account.

Answer (B) is correct. The expected total cash inflow in the final year of the project consists of (1) $60,000 of cash flows from ongoing operations [$100,000 gross cash inflow \times (1.0 - .40 \text{ tax rate})], (2) a $6,400 depreciation tax shield [($16,000 annual depreciation expense on new equipment) \times .40], (3) the after-tax cash inflow from disposal of the new equipment, in this case $6,000 [$10,000 disposal value \times (1.0 - .40 \text{ tax rate})], and (4) recovery of the working capital set aside for the project ($24,000). The expected total cash inflow in the final year of the project is thus $96,400 ($60,000 + $6,400 + $6,000 + $24,000).

Answer (C) is incorrect because the amount of $90,000 results from failing to include the depreciation tax shield.

Answer (D) is incorrect because the amount of $72,400 results from improperly excluding recovery of working capital.

A firm is considering a capital project for which the following information is available: An existing piece of equipment that would be disposed of to make room for new equipment has a historical cost of $360,000. It has a salvage value of $10,000 and has been depreciated on a straight-line basis for 16 of the estimated 18 years of its useful life. The new equipment has a cost of $500,000 and the firm expects it will have to devote $20,000 in cash and $24,000 in accounts receivable to the new project. The firm’s effective tax rate is 40%. The required net initial investment in the new project is

A. $544,000  
B. $534,000  
C. $522,000  
D. $498,000

Answer (A) is incorrect because the amount of $544,000 results from neglecting to deduct the net after-tax cash inflow from the disposal of the old equipment.

Answer (B) is incorrect because the amount of $534,000 results from neglecting to take the tax benefit on the loss on disposal of the old equipment into account.

Answer (C) is correct. The net initial investment consists of the initial outlay for new equipment ($500,000) plus the increase to working capital ($44,000) minus the net after-tax cash flow from the disposal of the old equipment, which is calculated as follows:

\[
\begin{array}{l}
\text{Disposal value} \quad $10,000 \\
\text{Less: tax basis} \quad (40,000) \\
\text{Tax-basis loss on disposal} \quad $(30,000) \\
\text{Tax-basis loss on disposal} \quad $30,000 \\
\text{Times: tax rate} \quad \times \quad 40\% \\
\text{Tax benefit from disposal} \quad $12,000 \\
\text{Disposal value} \quad $10,000 \\
\text{Add: tax benefit on loss} \quad 12,000 \\
\text{After-tax cash inflow from disposal} \quad $22,000 \\
\end{array}
\]

The net initial investment is therefore $522,000 ($500,000 + $44,000 - $22,000).

Answer (D) is incorrect because the amount of $498,000 results from neglecting to take the increase in accounts receivable into account.
A firm is considering a new capital project. A salvage company is offering the firm $800,000 for its old equipment. If the firm accepts the salvage company’s offer, the net initial investment in the project will be

A. Less if the carrying amount is less than the $800,000 offer.
B. Greater if the carrying amount is less than the $800,000 offer.
C. Unaffected by whether a gain or loss is recognized on the disposal.
D. Not determinable from the information given.

- Answer (A) is correct. The net initial investment is increased by the proceeds from disposal of old equipment. If the salvage company’s offer exceeds the carrying amount of the equipment, an accrual-basis gain results. A loss on disposal provides a tax benefit because it reduces accrual-basis income. A gain, which increases accrual-basis income, results in a tax detriment. Thus, the net initial investment is less if the $800,000 offer exceeds the carrying amount.
- Answer (B) is incorrect because a gain results in a lower after-tax inflow than a loss, and the initial net investment will be lower.
- Answer (C) is incorrect because a gain on disposal and a loss on disposal have opposite effects on the net initial investment. A gain results in a lower after-tax inflow than a loss, and the initial net investment will be lower.
- Answer (D) is incorrect because the correct answer can be determined from the information given.

Assume that the old equipment, which has not yet been fully depreciated, must be sold in order to purchase the new equipment. The entity’s policy is to depreciate all equipment on a straight-line basis. Given a constant effective income tax rate, the incremental depreciation tax shield during the later years of a capital project is generally

A. Greater than that during the earlier years.
B. Less than that during the earlier years.
C. The same as that during the earlier years.
D. Not determinable from the information given.

- Answer (A) is correct. Older equipment that is being disposed of is reaching the end of its productive life. Thus, in the early years of the project, the depreciation expense on the new equipment only provides an incremental tax benefit since there was some depreciation expense still being recognized on the old equipment. Once the time of the old equipment’s useful life has passed, all the depreciation tax shield is being provided by the (higher) expense being recognized on the new equipment.
- Answer (B) is incorrect because the depreciation expense on the newer equipment will be higher once the time of the old equipment’s useful life has passed.
- Answer (C) is incorrect because the depreciation expense on the newer equipment will generally be different from that on the old equipment.
- Answer (D) is incorrect because the correct answer can be determined from the information given.

Which of the following is irrelevant in projecting the cash flows of the final year of a capital project?

A. Cash devoted to use in project.
B. Disposal value of equipment purchased specifically for project.
C. Depreciation tax shield generated by equipment purchased specifically for project.
D. Historical cost of equipment disposed of in the project’s first year.

- Answer (A) is incorrect because the recovery of working capital devoted to a capital project is a relevant cash flow in the final year.
Answer (B) is incorrect because the disposal value of equipment acquired for the project is relevant in the final year.
Answer (C) is incorrect because the depreciation tax shield generated by equipment acquired for the project is relevant to the final year.
Answer (D) is correct. Once an old piece of equipment has been disposed of, its historical cost no longer has an impact on a firm’s cash flows.

[1392] Capital budgeting is concerned with

A. Decisions affecting only capital intensive industries.
B. Analysis of short-range decisions.
C. Analysis of long-range decisions.
D. Scheduling office personnel in office buildings.

Answer (A) is incorrect because capital budgeting is useful for all long-range decision making.
Answer (B) is incorrect because capital budgeting is not useful for short-range decisions.
Answer (C) is correct. Capital budgeting is concerned with long-range decisions, such as whether to add a product line, to build new facilities, or to lease or buy equipment. Any decision regarding cash inflows and outflows over a period of more than 1 year probably needs capital budgeting analysis.
Answer (D) is incorrect because it is a nonsense answer.

[1393] Capital budgeting is used for the decision analysis of

A. Adding product lines or facilities.
B. Multiple profitable alternatives.
C. Lease-or-buy decisions.
D. All of the answers are correct.

Answer (A) is incorrect because capital budgeting may also be used for analysis of multiple profitable alternatives and of lease-or-buy decisions.
Answer (B) is incorrect because capital budgeting permits analysis of adding or discontinuing product lines or facilities and of lease-or-buy decisions.
Answer (C) is incorrect because the lease-or-buy decision is just one specific example of an appropriate use of capital budgeting techniques.
Answer (D) is correct. The capital budgeting process is a method of planning the efficient expenditure of the firm’s resources on capital projects. Such planning is essential in view of the rising costs of scarce resources.

[Fact Pattern #149]
The tax impact of equipment depreciation affects capital budgeting decisions. Currently, the Modified Accelerated Cost Recovery System (MACRS) is used as the depreciation method for most assets for tax purposes.
The MACRS method of depreciation for assets with 3, 5, 7, and 10-year recovery periods is most similar to which one of the following depreciation methods used for financial reporting purposes?

A. Straight-line.
B. Units-of-production.
C. Sum-of-the-years’-digits.
D. 200% declining-balance.

- Answer (A) is incorrect because the straight-line method uses the same percentage each year during an asset’s life, but MACRS uses various percentages.
- Answer (B) is incorrect because MACRS is unrelated to the units-of-production method.
- Answer (C) is incorrect because MACRS is unrelated to SYD depreciation.
- Answer (D) is correct. MACRS for assets with lives of 10 years or less is based on the 200% declining-balance method of depreciation. Thus, an asset with a 3-year life would have a straight-line rate of 33-1/3%, or a double-declining-balance rate of 66-2/3%.

When employing the MACRS method of depreciation in a capital budgeting decision, the use of MACRS as compared with the straight-line method of depreciation will result in

A. Equal total depreciation for both methods.
B. MACRS producing less total depreciation than straight line.
C. Equal total tax payments, after discounting for the time value of money.
D. MACRS producing more total depreciation than straight line.

- Answer (A) is correct. For tax purposes, straight-line depreciation is an alternative to the MACRS method. Both methods will result in the same total depreciation over the life of the asset; however, MACRS will result in greater depreciation in the early years of the asset’s life because it is an accelerated method. Given that MACRS results in larger depreciation deductions in the early years, taxes will be lower in the early years and higher in the later years. Because the incremental benefits will be discounted over a shorter period than the incremental depreciation costs, MACRS is preferable to the straight-line method.
- Answer (B) is incorrect because both methods will produce the same total depreciation over the life of the asset.
- Answer (C) is incorrect because both methods will produce the same total tax payments (assuming rates do not change). However, given that the tax payments will be lower in the early years under MACRS, discounting for the time value of money makes the straight-line alternative less advantageous.
- Answer (D) is incorrect because both methods will produce the same total depreciation over the life of the asset.
The U.S. Postal Service is looking for a new machine to help sort the mail. Two companies have submitted bids to Cliff Kraven, the postal inspector responsible for choosing a machine. A cash flow analysis of the two machines indicates the following:

<table>
<thead>
<tr>
<th>Year</th>
<th>Machine A</th>
<th>Machine B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(30,000)</td>
<td>$(30,000)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>13,000</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>13,000</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>13,000</td>
</tr>
<tr>
<td>4</td>
<td>60,000</td>
<td>13,000</td>
</tr>
</tbody>
</table>

If the cost of capital for the Postal Service is 8%, which of the two mail sorters should Cliff choose and why?

A. Machine A, because NPV of A > NPV of B, by $1,044.
B. Machine B, because NPV of A > NPV of B, by $22,000.
C. Machine A, because NPV of A > NPV of B, by $8,000.
D. Machine B, because IRR of A > IRR of B.

Answer (A) is correct. The NPV of both machines must be calculated and compared to determine which will yield a better return of cash flows. Machine A is calculated as one lump sum payable in 4 years minus the initial investment cost.

\[
\text{NPV}_A = (60,000 \times 0.73503) - 30,000 = 44,102 - 30,000 = 14,102
\]

The NPV of Machine B is calculated as the present value of an ordinary annuity of $13,000 for 4 years, minus the initial investment cost.

\[
\text{NPV}_B = (13,000 \times 3.31213) - 30,000 = 43,058 - 30,000 = 13,058
\]

By comparing the NPV of both machines, Cliff would choose Machine A because NPV of A > NPV of B by $1,044.

Answer (B) is incorrect because Machine A is a better choice.
Answer (C) is incorrect because The difference is $1,044.
Answer (D) is incorrect because Machine A has the higher NPV.

The Hopkins Company has estimated that a proposed project’s 10-year annual net cash benefit, received each year end, will be $2,500 with an additional terminal benefit of $5,000 at the end of the 10th year. Assuming that these cash inflows satisfy exactly Hopkins’ required rate of return of 8%, calculate the initial cash outlay.

A. $16,775
B. $19,090
C. $25,000
D. $30,000

Answer (A) is incorrect because The amount of $16,775 failed to include the present value of the $5,000 terminal benefit.
Answer (B) is correct. If the 8% return exactly equals the present value of the future flows (i.e., the NPV is zero), then simply determine the present value of the future inflows. Thus, Hopkins Company’s initial cash outlay is $19,090 [($2,500)(PVIFA at 8% for 10 periods) + ($5,000)(PVIF at 8% for 10 periods) = ($2,500)(6.710) + ($5,000)(.463)].
Answer (C) is incorrect because they do not use present value analysis.
Answer (D) is incorrect because they do not use present value analysis.

The chief financial officer of Pauley, Inc., has requested an evaluation of a proposed acquisition of a new machine at a purchase price of $60,000 and with installation costs of $10,000. A $3,000 increase in working capital will be required. The machine will have a useful life of 4 years, after which it can be sold for $10,000. The estimated annual incremental operating revenues and cash operating expenses are $150,000 and $100,000, respectively, for each of the 4 years. Pauley’s effective income tax rate is 40%, and the cost of capital is 12%. Pauley uses straight-line depreciation for both financial reporting and income tax purposes.

Pauley’s estimated after-tax cash flow in the fourth year, at which time the equipment will be sold, will be:

A. $37,000
B. $46,000
C. $49,000
D. $50,000

Answer (A) is incorrect because the amount of $37,000 results from ignoring the recovery of initial working capital and failing to consider the sale of the equipment.
Answer (B) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components: the after-tax cash inflows from operations and the depreciation tax shield arising from the purchase of new equipment (note that salvage value is not subtracted when calculating the depreciation tax shield). The first of these for Pauley can be calculated as follows:

Net annual operating revenue ($150,000 – $100,000) $50,000
Less: income tax expense ($50,000 × 40%) (20,000)
After-tax cash inflow from operations $30,000

The depreciation tax shield is derived as follows:

Cost of new equipment ($60,000 + $10,000) $70,000
Divided by: estimated useful life 4
Annual depreciation expense $17,500
Times: tax rate × 40%
Annual depreciation tax shield $7,000

Pauley’s total after-tax operating cash inflow for each year of the project’s life is thus $37,000 ($30,000 + $7,000). In the final year of the project, two additional cash flows must be taken into account, the after-tax proceeds from the disposal of the equipment purchased for the project, and the recovery of working capital devoted to the project. These two additional cash flows can be calculated as follows:

Disposal value of new equipment $10,000
Income tax effect of gain/loss (4,000)
After-tax cash inflow from disposal $6,000
Add: recovery of working capital 3,000
Additional final-year net cash inflow $9,000

Pauley’s total after-tax cash inflow for the final year of the project’s life is thus $46,000 ($37,000 + $9,000).
Answer (C) is incorrect because the amount of $49,000 results from improperly subtracting salvage value when calculating the depreciable base of the new equipment.
Answer (D) is incorrect because the amount of $50,000 results from failing to subject the proceeds from the disposal of the new equipment to income taxes.
The management of Pelican, Inc., is evaluating a proposed acquisition of a new machine at a purchase price of $180,000 and with installation costs of $10,000. A $9,000 increase in working capital will be required. The machine will have a useful life of 4 years, after which it can be sold for $30,000. The estimated annual incremental operating revenues and cash operating expenses are $450,000 and $300,000, respectively, for each of the 4 years. Pelican’s effective income tax rate is 40%, and the cost of capital is 12%. Pelican uses straight-line depreciation for both financial reporting and income tax purposes.

If the project is accepted, the estimated incremental after-tax operating cash flows at the end of the first year will be:

A. $90,000
B. $106,000
C. $109,000
D. $150,000

- Answer (A) is incorrect because the amount of $90,000 results from neglecting the depreciation tax shield.
- Answer (B) is incorrect because the amount of $106,000 results from improperly subtracting salvage value when calculating the depreciation tax shield.
- Answer (C) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components: the after-tax cash inflows from operations and the depreciation tax shield arising from the purchase of new equipment (note that salvage value is not subtracted when calculating the depreciation tax shield). The first of these for Pelican can be calculated as follows:

\[
\text{Net annual operating revenue} = (\text{Net annual operating revenue}) = 150,000 \\
\text{Less: income tax expense} = (\text{Net annual operating revenue} \times 40\%) = 60,000 \\
\text{After-tax cash inflow from operations} = 90,000
\]

The depreciation tax shield is derived as follows:

\[
\text{Cost of new equipment} = (180,000 + 10,000) = 190,000 \\
\text{Divided by: estimated useful life} = 4 \\
\text{Annual depreciation expense} = 47,500 \\
\text{Times: tax rate} = 0.40 \\
\text{Annual depreciation tax shield} = 19,000
\]

Pelican’s total incremental after-tax operating cash flows for each year of the project’s life is thus $109,000 ($90,000 + $19,000).

- Answer (D) is incorrect because the amount of $150,000 results from neglecting to account for the effect of income taxes on operating revenues and from neglecting to consider the depreciation tax shield.

Mobile Home Manufacturing, Inc., is evaluating a proposed acquisition of a new machine at a purchase price of $380,000 and installation charges that will amount to $20,000. A $15,000 increase in working capital will be required. The machine will have a useful life of 4 years, after which it can be sold for $50,000. The estimated annual incremental operating revenues and cash operating expenses are $750,000 and $500,000, respectively, for each of the 4 years. Mobile Home’s tax rate is 40%, and the cost of capital is 12%. Mobile Home uses straight-line depreciation for both financial reporting and income tax purposes.

If Mobile Home accepts the project, the initial investment will be:

A. $345,000
B. $365,000
C. $385,000
D. $415,000
Answer (A) is incorrect because the amount of $345,000 results from improperly netting the installation costs and the increase in working capital against the purchase price of the new equipment. 
Answer (B) is incorrect because the amount of $365,000 results from improperly netting the increase in working capital against the purchase price of the new equipment. 
Answer (C) is incorrect because the amount of $385,000 results from improperly netting the increase in working capital against the full cost of the new equipment. 
Answer (D) is correct. The net initial investment for a capital project consists of three components: the purchase of new equipment, the increase in working capital, and the salvage value of old equipment. Mobile Home Manufacturing’s calculation is thus as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of new equipment ($380,000 + $20,000)</td>
<td>$400,000</td>
</tr>
<tr>
<td>Increase in working capital</td>
<td>15,000</td>
</tr>
<tr>
<td>Salvage value of old equipment</td>
<td>0</td>
</tr>
<tr>
<td><strong>Net initial investment</strong></td>
<td><strong>$415,000</strong></td>
</tr>
</tbody>
</table>

A company is considering the purchase of a new machine to replace a five-year old machine and has gathered the following information:

- Purchase price of new machine: $50,000
- Installation cost of new machine: 4,000
- Market value (selling price) of the old machine: 5,000
- Book value of the old machine: 2,000
- Increase in net working capital if new machine is installed: 1,000
- Effective income tax rate: 40%

If the company replaces the old machine with the new machine, what is the cash flow in period 0.

A. $(49,000) 
B. $(51,200) 
C. $(51,800) 
D. $(53,000)

Answer (A) is incorrect because improperly netting the salvage value of the old equipment against the full cost of the new equipment results in $(49,000).
Answer (B) is correct. The net initial investment for a capital project consists of three components: the purchase of new equipment, the increase in working capital, and the after-tax proceeds from the disposal of old equipment. For this company, the first of these is $54,000 ($50,000 + $4,000), and the second is $1,000. The calculation of the after-tax proceeds from the disposal of the old equipment is as follows:

Salvage value of old equipment $ 5,000
Less: current tax value (2,000)
Tax-basis gain(loss) on disposal $ 3,000
Times: tax rate × 40%
Tax detriment(benefit) from disposal $ 1,200
Salvage value of old equipment $ 5,000
Less: tax detriment from gain on disposal (1,200)
After-tax cash inflow from disposal $ 3,800

The net cash flow for period 0 is therefore:

Full cost of new equipment ($50,000 + $4,000) $54,000
Increase in working capital 1,000
After-tax proceeds from disposal of old equipment (3,800)
Net initial investment $51,200

Answer (C) is incorrect because the amount of $(51,800) results from using the complement of the tax rate instead of the tax rate.
Answer (D) is incorrect because the amount of $(53,000) results from improperly netting the increase in working capital against the full cost of the new equipment.

Which one of the following capital investment evaluation methods does not take the time value of money into consideration?

A. Net present value.
B. Discounted payback.
C. Internal rate of return.
D. Accounting rate of return.

Answer (A) is incorrect because the net present value is the sum of the present values of all the cash inflows and outflows associated with an investment.
Answer (B) is incorrect because the discounted payback method calculates the payback period by determining the present values of the future cash flows.
Answer (C) is incorrect because the internal rate of return is the discount rate at which the NPV is zero.
Answer (D) is correct. The accounting rate of return (unadjusted rate of return or rate of return on the carrying amount) equals accounting net income divided by the required initial or average investment. The accounting rate of return ignores the time value of money.

Capital investment projects include proposals for all of the following except

A. The acquisition of government mandated pollution control equipment.
B. The expansion of existing product offerings.
C. Additional research and development facilities.
D. Refinancing existing working capital agreements.
Answer (A) is incorrect because Pollution control equipment is a long-lived capital asset.
Answer (B) is incorrect because Expansion of existing product offerings is a long-term decision.
Answer (C) is incorrect because Research and development facilities are long-lived capital assets.
Answer (D) is correct. Working capital consists of the most liquid of current assets. Capital budgeting techniques are appropriate for long-term projects.

Which one of the following items is least likely to directly impact an equipment replacement capital expenditure decision?

A. The net present value of the equipment that is being replaced.
B. The depreciation rate that will be used for tax purposes on the new asset.
C. The amount of additional accounts receivable that will be generated from increased production and sales.
D. The sales value of the asset that is being replaced.

- Answer (A) is correct. The only relevant valuation of existing equipment is its salvage value at the time of the decision.
- Answer (B) is incorrect because The depreciation rate for tax purposes on the new asset will determine the depreciation tax shield.
- Answer (C) is incorrect because The additional working capital associated with the new equipment is relevant to the decision.
- Answer (D) is incorrect because The salvage value of the existing equipment is relevant to the decision.

Cora Lewis is performing an analysis to determine if her firm should invest in new equipment to produce a product recently developed by her firm. The option would be to abandon the product. She uses the net present value (NPV) method and discounts at the firm’s cost of capital. Cora is contemplating how to handle the following items:

I. The book value of warehouse space currently used by another division.
II. Interest payments on debt to finance the equipment.
III. Increased levels of accounts payable and inventory.
IV. R&D spent in prior years and treated as a deferred asset for book and tax purposes.

Which of the above items are relevant for Cora to consider in determining the cash flows for her NPV calculation?

A. I, II, III and IV.
B. II and III only.
C. IV only.
D. III and IV only.

- Answer (A) is incorrect because The book value of warehouse space currently in use and R&D costs already incurred are irrelevant.
- Answer (B) is correct. The relevant costs in any decision are those costs that will vary depending on the choice made. The book value of warehouse space currently in use is irrelevant because it remains the same regardless of whether or not the new product is produced. Interest on newly incurred debt is relevant, as is increased levels of accounts payable and inventory. R&D costs already incurred are sunk costs and are therefore irrelevant.
- Answer (C) is incorrect because R&D costs already incurred are irrelevant.
- Answer (D) is incorrect because R&D costs already incurred are irrelevant.
Calvin, Inc., is considering the purchase of a new state-of-the-art machine to replace its hand-operated machine. Calvin’s effective tax rate is 40%, and its cost of capital is 12%. Data regarding the existing and new machines are presented below.

<table>
<thead>
<tr>
<th></th>
<th>Existing Machine</th>
<th>New Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original cost</td>
<td>$50,000</td>
<td>$90,000</td>
</tr>
<tr>
<td>Installation costs</td>
<td>0</td>
<td>4,000</td>
</tr>
<tr>
<td>Freight and insurance</td>
<td>0</td>
<td>6,000</td>
</tr>
<tr>
<td>Expected end salvage value</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Depreciation method</td>
<td>straight-line</td>
<td>straight-line</td>
</tr>
<tr>
<td>Expected useful life</td>
<td>10 years</td>
<td>5 years</td>
</tr>
</tbody>
</table>

The existing machine has been in service for 7 years and could be sold currently for $25,000. Calvin expects to realize a before-tax annual reduction in labor costs of $30,000 if the new machine is purchased and placed in service.

If the new machine is purchased, the incremental cash flows for the fifth year would amount to

A. $18,000  
B. $24,000  
C. $26,000  
D. $30,000

- Answer (A) is incorrect because the amount of $18,000 results from failing to include the depreciation tax shield.  
- Answer (B) is incorrect because the incremental cash flow during the first 3 years of the project, when the lost depreciation on the old equipment is still relevant, is $24,000.  
- Answer (C) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components, the after-tax cash inflows from operations and the difference in depreciation tax shields between the old and new equipment. The first of these for Calvin can be calculated as follows:

\[
\begin{align*}
\text{Net annual labor cost savings} & = 30,000 \\
\text{Less: income tax expense (30,000 \times 40\%)} & = (12,000) \\
\text{After-tax cash inflow from operations} & = 18,000
\end{align*}
\]

The depreciation tax shield on the new equipment is derived as follows:

\[
\begin{align*}
\text{Cost of new equipment} & = (90,000 + 4,000 + 6,000) = 100,000 \\
\text{Divided by: estimated useful life} & = 5 \\
\text{Annual depreciation expense} & = 20,000 \\
\text{Times: tax rate} & = 40\% \\
\text{Annual depreciation tax shield} & = 8,000
\end{align*}
\]

The depreciation tax shield in the fifth year consists only of the total shield generated by the new equipment. Since the old equipment only has 3 years of service life remaining, it will have no incremental effect on Years 4 and 5. Calvin’s total incremental cash flow for the fifth year of this project is therefore estimated at $26,000 ($18,000 + $8,000).

- Answer (D) is incorrect because the amount of $30,000 is merely the before-tax savings in labor cost.
The existing machine has been in service for 7 years and could be sold currently for $25,000. If the new machine is purchased, Calvin expects to realize a $30,000 before-tax annual reduction in labor costs.

If the new machine is purchased, what is the net amount of the initial cash outflow at time = 0 for net present value calculation purposes?

A. $65,000
B. $75,000
C. $79,000
D. $100,000

- Answer (A) is incorrect because the amount of $65,000 results from improperly netting the accumulated depreciation on the existing equipment against the full cost of the new equipment.
- Answer (B) is incorrect because the amount of $75,000 results from improperly adding the salvage value of the old equipment to its historical cost.
- Answer (C) is correct. The net initial investment for a capital project consists of three components: the purchase of new equipment, the increase in working capital, and the after-tax proceeds from the disposal of old equipment. For Calvin, the first of these is $100,000 ($90,000 + $4,000 + $6,000), and the second is $0. The calculation of the after-tax proceeds from the disposal of the old equipment is as follows:

Proceeds from sale of old equipment $25,000

Tax effect.
Salvage value $ 25,000
Less: current book value
   [($50,000 × (3 ÷ 10 years))] (15,000)
Accrual-basis gain on disposal $ 10,000
Times: tax rate × 40%
Tax detriment from gain on disposal (4,000)
After-tax cash inflow from disposal of old equipment $21,000

The net cash flow for period 0 is therefore:

Full cost of new equipment $100,000
After-tax cash inflow from disposal of old equipment (21,000)
Net initial investment $ 79,000

- Answer (D) is incorrect because the cost of the new equipment is merely $100,000.
Answer (A) is incorrect because the amount of $18,000 results from failing to include the depreciation tax shield.

Answer (B) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components, the after-tax cash inflows from operations and the difference in depreciation tax shields between the old and new equipment. The first of these for Calvin can be calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net annual labor cost savings</td>
<td>$30,000</td>
</tr>
<tr>
<td>Less: income tax expense (30,000 × 40%)</td>
<td>(12,000)</td>
</tr>
<tr>
<td>After-tax cash inflow from operations</td>
<td>$18,000</td>
</tr>
</tbody>
</table>

The depreciation tax shield on the new equipment is derived as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of new equipment ($90,000 + $4,000 + $6,000)</td>
<td>$100,000</td>
</tr>
<tr>
<td>Divided by: estimated useful life</td>
<td>÷ 5</td>
</tr>
<tr>
<td>Annual depreciation expense</td>
<td>$20,000</td>
</tr>
<tr>
<td>Times: tax rate</td>
<td>× 40%</td>
</tr>
<tr>
<td>Annual depreciation tax shield -- new equipment</td>
<td>$8,000</td>
</tr>
</tbody>
</table>

The depreciation tax shield on the old equipment is derived as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of old equipment</td>
<td>$50,000</td>
</tr>
<tr>
<td>Less: accumulated depreciation [$50,000 × (5 ÷ 10 years)]</td>
<td>(25,000)</td>
</tr>
<tr>
<td>Current book value</td>
<td>$25,000</td>
</tr>
<tr>
<td>Divided by: remaining useful life</td>
<td>÷ 5</td>
</tr>
<tr>
<td>Annual depreciation expense</td>
<td>$5,000</td>
</tr>
<tr>
<td>Times: tax rate</td>
<td>× 40%</td>
</tr>
<tr>
<td>Annual depreciation tax shield -- old equipment</td>
<td>$2,000</td>
</tr>
</tbody>
</table>

The difference in the two depreciation tax shields is $6,000 ($8,000 – $2,000). Calvin’s total incremental cash flow for the first year of this project is therefore estimated at $24,000 ($18,000 + $6,000).

Answer (C) is incorrect because the amount of $30,000 is merely the before-tax savings in labor cost.

Answer (D) is incorrect because the amount of $45,000 results from using the difference in depreciation expense between the two pieces of equipment without accounting for the effect of income taxes.

---

**Fact Pattern #151**

Olson Industries needs to add a small plant to accommodate a special contract to supply building materials over a 5-year period. The required initial cash outlays at time = 0 are as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>$500,000</td>
</tr>
<tr>
<td>New building</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Equipment</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

Olson uses straight-line depreciation for tax purposes and will depreciate the building over 10 years and the equipment over 5 years. Olson’s effective tax rate is 40%. Revenues from the special contract are estimated at $1.2 million annually, and cash expenses are estimated at $300,000 annually. At the end of the fifth year, the assumed sales values of the land and building are $800,000 and $500,000, respectively. It is further assumed the equipment will be removed at a cost of $50,000 and sold for $300,000.
As Olson utilizes the net present value (NPV) method to analyze investments, the net cash flow for Period 3 would be:

A. $60,000  
B. $860,000  
C. $880,000  
D. $940,000

- Answer (A) is incorrect because the amount of $60,000 is accrual-basis net income.
- Answer (B) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components, the after-tax cash inflows from operations and the difference in depreciation tax shields between the old and new assets. The first of these for Olson can be calculated as follows:

  Projected annual revenues $1,200,000  
  Less: annual expenses $300,000  
  Net annual cash inflow $900,000  
  Less: income tax expense ($900,000 x 40%) $360,000  
  After-tax cash inflow from operations $540,000

Since no old equipment was removed, the total depreciation tax shield is simply derived from the new building and equipment:

  Annual depreciation on new building ($2,000,000 ÷ 10) $200,000  
  Annual depreciation on new equipment ($3,000,000 ÷ 5) $600,000  
  Annual depreciation expense $800,000  
  Times: income tax rate x 40%  
  Annual depreciation tax shield $320,000

The after-tax cash flows for Year 3 for this project would thus amount to $860,000 ($540,000 + $320,000).

- Answer (C) is incorrect because the amount of $880,000 results from depreciating the land.
- Answer (D) is incorrect because the amount of $940,000 results from depreciating the building over 5 years rather than 10.

As Olson utilizes the net present value (NPV) method to analyze investments, the net cash flow for Period 5 would be:

A. $1,710,000  
B. $2,070,000  
C. $2,230,000  
D. $2,390,000

- Answer (A) is incorrect because the amount of $1,710,000 results from failing to include the proceeds from the sale of the land.
- Answer (B) is incorrect because the amount of $2,070,000 results from failing to include the depreciation tax shield.
- Answer (C) is incorrect because the amount of $2,230,000 results from depreciating the land.
Answer (D) is correct. The estimated incremental after-tax operating cash flows in the final year of a capital project consist of three components: the after-tax cash inflows from operations, the depreciation tax shield, and the net termination cash flows of the project. The first of these for Olson can be calculated as follows:

Projected annual revenues $1,200,000
Less: annual expenses (300,000)
Net annual cash inflow $900,000
Less: income tax expense ($900,000 × 40%) (360,000)
After-tax cash inflow from operations $540,000

Since no old equipment was removed, the total depreciation tax shield is simply derived from the new building and equipment.

Annual depreciation on new building ($2,000,000 ÷ 10) $200,000
Annual depreciation on new equipment ($3,000,000 ÷ 5) 600,000
Annual depreciation expense $800,000
Times: income tax rate × 40%
Annual depreciation tax shield $320,000

The calculation of the after-tax proceeds from the disposal of the land, building, and equipment involved in the project is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Land</th>
<th>Building</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proceeds from disposal</td>
<td>$800,000</td>
<td>$500,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Less: current book value</td>
<td>(500,000)</td>
<td>(1,000,000)</td>
<td>(0)</td>
</tr>
<tr>
<td>Accrual-basis gain (loss) on disposal</td>
<td>$300,000</td>
<td>($500,000)</td>
<td>$250,000</td>
</tr>
<tr>
<td>Times: tax rate × 40%</td>
<td>× 40%</td>
<td>× 40%</td>
<td>× 40%</td>
</tr>
<tr>
<td>Tax detriment (benefit) from disposal</td>
<td>$120,000</td>
<td>($200,000)</td>
<td>$100,000</td>
</tr>
<tr>
<td>Proceeds from disposal</td>
<td>$800,000</td>
<td>$500,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Add: tax benefit (detriment)</td>
<td>(120,000)</td>
<td>200,000</td>
<td>(100,000)</td>
</tr>
<tr>
<td>After-tax cash inflow from disposal</td>
<td>$680,000</td>
<td>$700,000</td>
<td>$150,000</td>
</tr>
</tbody>
</table>

Total expected cash flows in the fifth year of the project are thus $2,390,000 calculated as follows:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>After-tax cash inflow from operations</td>
<td></td>
<td></td>
<td>$540,000</td>
</tr>
<tr>
<td>Annual depreciation tax shield</td>
<td></td>
<td>320,000</td>
<td></td>
</tr>
<tr>
<td>After-tax cash inflow from disposal of land</td>
<td></td>
<td></td>
<td>680,000</td>
</tr>
<tr>
<td>After-tax cash inflow from disposal of building</td>
<td></td>
<td></td>
<td>700,000</td>
</tr>
<tr>
<td>After-tax cash inflow from disposal of equipment</td>
<td></td>
<td></td>
<td>150,000</td>
</tr>
<tr>
<td>Total expected cash inflows</td>
<td></td>
<td></td>
<td>$2,390,000</td>
</tr>
</tbody>
</table>
The following schedule reflects the incremental costs and revenues for a capital project. The company uses straight-line depreciation. The interest expense reflects an allocation of interest on the amount of this investment, which is based on the company’s weighted average cost of capital.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$650,000</td>
</tr>
<tr>
<td>Direct costs</td>
<td>$270,000</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>50,000</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>20,000</td>
</tr>
<tr>
<td>Depreciation</td>
<td>70,000</td>
</tr>
<tr>
<td>General &amp; administrative</td>
<td>40,000</td>
</tr>
<tr>
<td>Interest expense</td>
<td>8,000</td>
</tr>
<tr>
<td>Total costs</td>
<td>(458,000)</td>
</tr>
<tr>
<td>Net profits before taxes</td>
<td>$192,000</td>
</tr>
</tbody>
</table>

The annual cash flow from this investment, before tax considerations, would be

A. $192,000  
B. $200,000  
C. $262,000  
D. $270,000

- Answer (A) is incorrect because the amount of $192,000 includes noncash items.
- Answer (B) is incorrect because the amount of $200,000 results from failing to add back depreciation, a noncash item.
- Answer (C) is incorrect because the amount of $262,000 results from failing to add back the allocated interest expense, a noncash item.
- Answer (D) is correct. To arrive at before-tax cash flow from this investment, items calculated on the accrual-basis must be taken out.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net profit before taxes</td>
<td>$192,000</td>
</tr>
<tr>
<td>Add back noncash items:</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>70,000</td>
</tr>
<tr>
<td>Allocated interest</td>
<td>8,000</td>
</tr>
<tr>
<td>Before-tax cash flow</td>
<td>$270,000</td>
</tr>
</tbody>
</table>

---

**Fact Pattern #152**

Kell, Inc., is analyzing an investment for a new product expected to have annual sales of 100,000 units for the next 5 years and then be discontinued. New equipment will be purchased for $1,200,000 and cost $300,000 to install. The equipment will be depreciated on a straight-line basis over 5 years for financial reporting purposes and 3 years for tax purposes. At the end of the fifth year, it will cost $100,000 to remove the equipment, which can be sold for $300,000. Additional working capital of $400,000 will be required immediately and needed for the life of the product. The product will sell for $80, with direct labor and material costs of $65 per unit. Annual indirect costs will increase by $500,000. Kell’s effective tax rate is 40%.
In a capital budgeting analysis, what is the expected cash flow at time = 5 (fifth year of operations) that Kell should use to compute the net present value?

A. $720,000  
B. $800,000  
C. $1,120,000  
D. $1,240,000

- Answer (A) is incorrect because the amount of $720,000 results from failing to include the recovery of working capital.
- Answer (B) is incorrect because the amount of $800,000 results from failing to account for the effects of income taxes on the disposal proceeds of the equipment and from failing to include the recovery of working capital.
- Answer (C) is correct. The estimated incremental after-tax operating cash flows in the final year of a capital project consist of three components: the after-tax cash inflows from operations, the depreciation tax shield, and the net termination cash flows of the project. The first of these for Kell can be calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected annual contribution margin</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Less: annual increase in indirect costs</td>
<td>($500,000)</td>
</tr>
<tr>
<td>Net annual cash inflow</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Less: income tax expense ($1,000,000 × 40%)</td>
<td>($400,000)</td>
</tr>
<tr>
<td>After-tax cash inflow from operations</td>
<td>$600,000</td>
</tr>
</tbody>
</table>

Since the equipment was depreciated over 3 years for tax purposes, no depreciation tax shield remains in the fifth year. The termination cash flows can be calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proceeds from disposal of new equipment</td>
<td>$200,000</td>
</tr>
<tr>
<td>Less: income tax expense ($200,000 × 40%)</td>
<td>($80,000)</td>
</tr>
<tr>
<td>After-tax cash inflow from disposal of equipment</td>
<td>$120,000</td>
</tr>
<tr>
<td>Add: recovery of working capital</td>
<td>$400,000</td>
</tr>
<tr>
<td>Total termination cash inflows</td>
<td>$520,000</td>
</tr>
</tbody>
</table>

Total expected cash flows in the fifth year of the project are thus $1,120,000 ($600,000 + $0 + $520,000).
- Answer (D) is incorrect because the amount of $1,240,000 results from improperly depreciating the equipment over the book life rather than the tax life.

In a capital budgeting analysis, what is the cash flow at time = 0 (initial investment) that Kell should use to compute the net present value?

A. $1,300,000  
B. $1,500,000  
C. $1,700,000  
D. $1,900,000

- Answer (A) is incorrect because the amount of $1,300,000 results from improperly subtracting the salvage value and failing to include the increase in working capital.
- Answer (B) is incorrect because the amount of $1,500,000 results from failing to include the increase in working capital.
Answer (C) is incorrect because the amount of $1,700,000 results from improperly including the salvage value and failing to include the increase in working capital.

Answer (D) is correct. The net initial investment for a capital project consists of three components: the purchase of new equipment (including installation costs), the increase in working capital, and the after-tax proceeds from the disposal of old equipment. For Kell, the first of these is $1,500,000 ($1,200,000 + $300,000), and the second is $400,000. No proceeds will be received on disposal because no existing equipment is being removed. Therefore, the net cash flow at time = 0 is calculated as follows:

<table>
<thead>
<tr>
<th>Full cost of new equipment</th>
<th>$1,500,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in working capital</td>
<td>400,000</td>
</tr>
<tr>
<td><strong>Net initial investment</strong></td>
<td><strong>$1,900,000</strong></td>
</tr>
</tbody>
</table>

In a capital budgeting analysis, what is the expected cash flow at time = 3 (third year of operation) that Kell should use to compute the net present value?

A. $300,000  
B. $720,000  
C. $760,000  
D. $800,000  

*Answer (A) is incorrect because the amount of $300,000 is only the annual depreciation expense for financial reporting purposes.*

*Answer (B) is incorrect because the amount of $720,000 results from using 5 years for depreciating the new equipment rather than 3.*

*Answer (C) is incorrect because the amount of $760,000 results from failing to include installation cost in the full cost of the new equipment.*

*Answer (D) is correct.* The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components, the after-tax cash inflows from operations and the difference in depreciation tax shields between the old and new equipment. The first of these for Kell can be calculated as follows:

Projected annual contribution margin

\[
\text{Projected annual contribution margin} = 100,000 \times 15 = 1,500,000
\]

Less: annual increase in indirect costs

\[
\text{Less: annual increase in indirect costs} = 500,000
\]

Net annual cash inflow

\[
\text{Net annual cash inflow} = 1,000,000
\]

Less: income tax expense ($1,000,000 \times 40\%)

\[
\text{Less: income tax expense} = 400,000
\]

After-tax cash inflow from operations

\[
\text{After-tax cash inflow from operations} = 600,000
\]

Since no old equipment was removed, the total depreciation tax shield is simply that derived from the new equipment:

\[
\text{Full cost of new equipment} = 1,500,000
\]

Divided by: estimated useful life for tax purposes

\[
\frac{1,500,000}{3} = 500,000
\]

Times: tax rate

\[
500,000 \times 40\% = 200,000
\]

The annual after-tax cash flows for this project would thus amount to $800,000 ($600,000 + $200,000).
Skytop Industries is analyzing a capital investment project using discounted cash flow (DCF) analysis. The new equipment will cost $250,000. Installation and transportation costs aggregating $25,000 will be capitalized. Annual incremental pre-tax cash inflows are estimated at $75,000. Skytop’s effective income tax rate is 40%.

[1415] (Refers to Fact Pattern #153)
In this scenario, Skytop will employ a 5-year MACRS depreciation schedule (20%, 32%, 19.2%, 11.52%, 11.52%, 5.76%) with the half-year convention. Existing equipment, with a book value of $100,000 and an estimated market value of $80,000, will be sold immediately after installation of the new equipment. After-tax cash flow for the first year of the project would amount to

A. $45,000
B. $52,000
C. $67,000
D. $75,000

- Answer (A) is incorrect because the amount of $45,000 includes only the after-tax annual cash inflows.
- Answer (B) is incorrect because the amount of $52,000 results from adding the income tax expense to the annual incremental cash flows to the depreciation tax shield.
- Answer (C) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components, the after-tax cash inflows from operations and the difference in depreciation tax shields between the old and new equipment. The first of these for Skytop can be calculated as follows:

\[
\begin{align*}
\text{Annual incremental pre-tax cash inflow} & \quad $75,000 \\
\text{Less: income tax expense ($75,000 \times 40\%)} & \quad (30,000) \\
\text{After-tax cash inflow from operations} & \quad $45,000
\end{align*}
\]

The depreciation tax shield provided by the new equipment is derived as follows:

\[
\begin{align*}
\text{Full cost -- new equipment} & \quad $275,000 \\
\text{Times: MACRS percentage} & \quad \times 20\% \\
\text{Depreciation expense -- first year} & \quad $ 55,000 \\
\text{Times: tax rate} & \quad \times 40\% \\
\text{Depreciation tax shield} & \quad $ 22,000
\end{align*}
\]

The after-tax cash flow for the first year of this project would thus amount to $67,000 ($45,000 + $22,000).
- Answer (D) is incorrect because the amount of $75,000 includes only the pre-tax annual cash inflows.

[1416] (Refers to Fact Pattern #153)
In this scenario, Skytop will immediately sell existing equipment after installation of the new equipment. The existing equipment has a tax basis of $100,000 and an estimated market value of $80,000. Skytop estimates that the new equipment’s capacity will generate additional receivables and inventory of $30,000, while payables will increase by $15,000. Total after-tax cash outflows occurring in Year 0 would be

A. $177,000
B. $182,000
C. $198,000
D. $202,000
Answer (A) is incorrect because the amount of $177,000 results from failing to include the installation and transportation costs of the new equipment.

Answer (B) is incorrect because the amount of $182,000 results from subtracting the book value of the old equipment rather than the proceeds.

Answer (C) is incorrect because the amount of $198,000 results from using \(1 – \text{tax rate}\) to calculate the tax effect of the proceeds on the old equipment.

Answer (D) is correct. The net initial investment for a capital project consists of three components: the purchase of new equipment, the increase in working capital, and the after-tax proceeds from the disposal of old equipment. For Skytop, the first of these is $275,000 ($250,000 purchase price + $25,000 installation and transportation) and the second is $15,000 ($30,000 increase in working capital – $15,000 increase in payables). The calculation of the after-tax proceeds from the disposal of the old equipment is as follows:

Proceeds from sale of old equipment $80,000

Tax effect:
- Salvage value $80,000
- Less: current book value (100,000)
- Accrual-basis loss on disposal $20,000
- Times: tax rate × 40%
- Tax benefit from loss on disposal 8,000
- After-tax cash inflow from disposal $88,000

The total after-tax cash outflows occurring in Year 0 are therefore calculated as follows:

Full cost of new equipment $275,000
Net increase in working capital 15,000
After-tax cash inflow from disposal of old equipment (88,000)
Net initial investment $202,000

[1417][Refers to Fact Pattern #153]

Skytop’s appropriate 5-year depreciation schedule (20%, 32%, 19%, 14.5%, 14.5%) will be employed with no terminal value factored into the computations. Assuming the machine is sold at the end of Year 5 for $30,000, the after-tax cash flow for Year 5 of the project would amount to

A. $63,950  
B. $72,950  
C. $78,950  
D. $86,925

- Answer (A) is incorrect because the amount of $63,950 results from dividing, rather than multiplying, the cost of the equipment by the MACRS factor and failing to include the disposal value of the new equipment.
- Answer (B) is incorrect because the amount of $72,950 results from including the income tax expense on the disposal proceeds of the new equipment rather than the after-tax cash flow.
Answer (C) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components, the after-tax cash inflows from operations and the tax shields on the new equipment. (In addition, since Year 5 is the final year of the project, the project termination cash flows must be considered.) For Skytop, the annual cash inflows from operations can be calculated as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual incremental pre-tax cash inflow</td>
<td>$75,000</td>
</tr>
<tr>
<td>Less: income tax expense ($75,000 × 40%)</td>
<td>$(30,000)</td>
</tr>
<tr>
<td>After-tax cash inflow from operations</td>
<td>$45,000</td>
</tr>
</tbody>
</table>

The relevant depreciation tax shield is the total tax shield provided by the new equipment, derived as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full cost -- new equipment</td>
<td>$275,000</td>
</tr>
<tr>
<td>Times: MACRS percentage × 14.5%</td>
<td></td>
</tr>
<tr>
<td>Depreciation expense -- fifth year</td>
<td>$39,875</td>
</tr>
<tr>
<td>Times: tax rate × 40%</td>
<td></td>
</tr>
<tr>
<td>Depreciation tax shield</td>
<td>$15,950</td>
</tr>
</tbody>
</table>

Because this is the final year of the project, the after-tax cash inflow from the disposal of the new equipment must be included [$30,000 × (1.0 – .40 tax rate) = $18,000]. The after-tax cash flow for the final year of this project would thus amount to $78,950 ($45,000 + $15,950 + $18,000).

Answer (D) is incorrect because The amount of $86,925 results from taking 1 1/2 year’s depreciation in the final year of the project.

[1418]Regis Company, which is subject to an effective income tax rate of 30%, is evaluating a proposed capital project. Relevant information for the proposed project is summarized below.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment</td>
<td>$500,000</td>
</tr>
<tr>
<td>Annual operating cash inflows</td>
<td></td>
</tr>
<tr>
<td>for the first 3 years:</td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>185,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>175,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>152,000</td>
</tr>
</tbody>
</table>

Depreciation will be calculated under the straight-line method using an 8-year estimated service life and a terminal value of $50,000. In determining the estimated total after-tax cash flow in Year 2 of the project, Regis should consider the after-tax operating cash

A. Inflow only.
B. Inflow plus annual depreciation expense.
C. Inflow plus annual depreciation tax shield.
D. Inflow plus the net impact of the annual depreciation expense and depreciation tax shield.

Answer (A) is incorrect because The depreciation tax shield must be considered as well.
Answer (B) is incorrect because The after-tax effect of depreciation expense, not depreciation expense itself, must be considered.
Answer (C) is correct. The estimated incremental after-tax operating cash flows for each year of a capital project consist of two components, the after-tax cash inflows from operations and the depreciation tax shield on the new equipment. Therefore, Regis should consider the after-tax operating cash inflow plus the annual depreciation tax shield.
Answer (D) is incorrect because The impact of the depreciation tax shield alone is added, not the net of depreciation expense.
Fuller Industries is considering a $1 million investment in stamping equipment to produce a new product. The equipment is expected to last 9 years, produce revenue of $700,000 per year, and have related cash expenses of $450,000 per year. At the end of the ninth year, the equipment is expected to have a salvage value of $100,000 and cost $50,000 to remove. The IRS categorizes this as 5-year Modified Accelerated Cost Recovery System (MACRS) property subject to the following depreciation rates.

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20.00%</td>
</tr>
<tr>
<td>2</td>
<td>32.00%</td>
</tr>
<tr>
<td>3</td>
<td>19.20%</td>
</tr>
<tr>
<td>4</td>
<td>11.52%</td>
</tr>
<tr>
<td>5</td>
<td>11.52%</td>
</tr>
<tr>
<td>6</td>
<td>5.76%</td>
</tr>
</tbody>
</table>

Fuller’s effective income tax rate is 40%, and Fuller expects, on an overall company basis, to continue to be profitable and have significant taxable income. If Fuller uses the net present value method to analyze investments, what is the expected net tax impact on cash flow in Year 2 before discounting.

A. Positive $28,000 impact.
B. $0 impact.
C. Negative $100,000 impact.
D. Negative $128,000 impact.

- Answer (A) is **correct**. Fuller’s pre-tax impact from the new equipment for Year 2 can be calculated as follows:

  Revenue $700,000
  Less: related cash expenses (450,000)
  Less: depreciation expense ($1,000,000 × 32.00%) (320,000)
  **Operating loss** $ (70,000)

  The net tax benefit resulting from this operating loss is a $28,000 positive impact ($70,000 × 40%).

- Answer (B) is incorrect because an operating loss provides a positive impact through the resulting tax benefit.
- Answer (C) is incorrect because a negative $100,000 impact results from failing to subtract depreciation expense.
- Answer (D) is incorrect because a negative $128,000 impact results from including only depreciation expense and reversing the sign.

In estimating “after-tax incremental cash flows” under discounted cash flow analysis for capital project evaluations, which one of the following options reflects the items that should be included in the analyses?

<table>
<thead>
<tr>
<th>Sunk Costs</th>
<th>Project related changes in net working capital</th>
<th>Estimated impacts on inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>B. No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>C. No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>D. Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because projected changes in working capital should be included in the analyses.
- Answer (B) is **correct**. Sunk costs are not relevant to any capital project decision. Projected changes in working capital and the estimated impacts of inflation should be included in the analyses.
AGC Company is considering an equipment upgrade. AGC uses discounted cash flow (DCF) analysis in evaluating capital investments and has an effective tax rate of 40%. Selected data developed by AGC is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Existing Equipment</th>
<th>New Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original cost</td>
<td>$50,000</td>
<td>$95,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>45,000</td>
<td>--</td>
</tr>
<tr>
<td>Current market value</td>
<td>3,000</td>
<td>95,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>6,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Accounts payable</td>
<td>2,100</td>
<td>2,500</td>
</tr>
</tbody>
</table>

Based on this information, what is the initial investment for a DCF analysis of this proposed upgrade.

A. $92,400  
B. $92,800  
C. $95,800  
D. $96,200

- Answer (A) is incorrect because The amount of $92,400 ignores the increase in accounts payable.  
- Answer (B) is correct. The net initial investment for a capital project consists of three components: the purchase of new equipment, the increase in working capital, and the after-tax proceeds from the disposal of old equipment. For AGC, the first of these is $95,000 and the second is $1,600 ($2,000 increase in receivables – $400 increase in payables). The calculation of the after-tax proceeds from the disposal of the old equipment is as follows:

  Proceeds from sale of old equipment $3,000  
  Tax effect:  
  Salvage value $3,000  
  Less: current book value (5,000)  
  Accrual-basis loss on disposal $(2,000)  
  Times: tax rate × 40%  
  Tax benefit from loss on disposal 800  
  After-tax cash inflow from disposal $3,800

Therefore, the total after-tax cash outflows occurring in Year 0 are as follows:

Full cost of new equipment $95,000  
Net increase in working capital 1,600  
After-tax cash inflow from disposal of old equipment (3,800)  
Net initial investment (92,800)

- Answer (C) is incorrect because The amount of $95,800 ignores the proceeds from the old equipment and the increase in working capital.  
- Answer (D) is incorrect because The amount of $96,200 ignores the proceeds of the old equipment and the increase in accounts payable.
In discounted cash flow techniques, which one of the following alternatives best reflects the items to be incorporated in the initial net cash investment.

<table>
<thead>
<tr>
<th>Capitalized expenditures (e.g., shipping costs)</th>
<th>Changes in working capital</th>
<th>Net proceeds from sale of old asset in spontaneous replacement decision</th>
<th>Impact of changes in current liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>B. Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>C. No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>D. Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Capitalized expenditures must be considered.
- Answer (B) is incorrect because Changes in working capital and proceeds from the sale of existing assets must be considered.
- Answer (C) is incorrect because Changes in working capital are not the only items that must be considered.
- Answer (D) is correct. All four of the items listed must be incorporated in a DCF analysis of a capital project.

The owner of Woofie’s Video Rental cannot decide how to project the real costs of opening a rental store in a new shopping mall. The owner knows the capital investment required but is not sure of the returns from a store in a new mall. Historically, the video rental industry has had an inflation rate equal to the economic norm. The owner requires a real internal rate of return of 10%. Inflation is expected to be 3% during the next few years. The industry expects a new store to show a growth rate, without inflation, of 8%. First year revenues at the new store are expected to be $400,000.

The revenues for the second year, using both the real rate approach and the nominal rate approach, respectively, would be:

A. $432,000 real and $444,960 nominal.
B. $432,000 real and $452,000 nominal.
C. $440,000 real and $452,000 nominal.
D. $440,000 real and $453,200 nominal.

- Answer (A) is correct. Woofie’s can calculate its projected sales for the second year as follows:

  First year revenues $400,000
  Times: sales growth rate $400,000 × 1.08
  Real projected sales $432,000
  Times: nominal inflation rate $432,000 × 1.03
  Nominal projected sales $444,960

- Answer (B) is incorrect because The amount of $452,000 nominal results from using 5% rather than 3% as the inflation rate.
- Answer (C) is incorrect because The amount of $440,000 real results from using the internal rate of return as the growth rate, and $452,000 nominal results from making a separate calculation for the effect of inflation using 5% as the inflation rate.
- Answer (D) is incorrect because The amount of $440,000 real results from using the internal rate of return as the growth rate.
The stage of the capital budgeting process that has the most risk is

A. Identifying alternative possible projects.
B. Forecasting cash flow.
C. Raising funds to initially support the project.

- Answer (A) is incorrect because Identifying alternative possible projects does not have the most risk in the capital budgeting process. There are many different methods that can aid in accurately identifying different projects. This reduces the risk of selecting alternatives.
- Answer (B) is correct. Forecasting cash flows has the most risk in the capital budgeting process. The economic benefit or cost must be estimated period by period. In addition, the economic life, depreciable life, and salvage value of the asset must be estimated. All of these estimates help forecast the cash flows for the project. Because this step requires the most use of estimates, it is said to be the riskiest in the capital budgeting process.
- Answer (C) is incorrect because Raising funds to initially support the project does not have the most risk in the capital budgeting process. This step does not require many estimations and is something management has control over, reducing the amount of risk involved.
- Answer (D) is incorrect because Evaluating performance and learning does not have the most risk in the capital budgeting process. Evaluating performance is based on quantitative measures that can be evaluated objectively, reducing the amount of risk involved.

Charles Company owns a building that originally cost $400,000 and has a current book value of $250,000. The building was financed by a loan that has one payment of $20,000 outstanding, which must be paid off upon the sale of the building. Charles Company would like to purchase a new building for $600,000. If the new building is purchased, the existing building would be sold for $380,000. Charles Company’s income tax rate is 40%. If the new building is purchased, the relevant initial cash flows would total

A. $272,000
B. $292,000
C. $372,000
D. $392,000

- Answer (A) is incorrect because The $272,000 option incorrectly excludes the $20,000 outflow for the loan payment from the calculation.
- Answer (B) is correct. The relevant initial cash flows total $292,000. The project will require an initial outlay of $600,000 for the new building and an outflow of $20,000 for the loan payment, which must be paid off upon the sale of the building. In order to calculate the after-tax proceeds from disposal of the existing building, first calculate the tax gain or loss, which is equal to a gain of $130,000 ($380,000 disposal value – $250,000 book value). The after-tax effect on cash can then be calculated as follows:

$$380,000 \text{ disposal value} - 52,000 \left( 130,000 \text{ gain} \times 40\% \text{ tax rate} \right) \text{ tax cost on gain} = 328,000 \text{ after-cash inflow}$$

Thus, the total initial cash outflow is equal to $292,000 ($600,000 initial outflow + $20,000 debt outflow – $328 after-tax inflow from sale of old building).

- Answer (C) is incorrect because The $372,000 option incorrectly calculates the after-tax cash inflow from the sale of the old equipment by multiplying the $380,000 disposal value by 1 minus the tax rate of 40%. This is incorrect because it ignores the effects of the tax gain on the transaction. This method also ignores the $20,000 initial outflow that must be paid in order to settle the debt on the building.
- Answer (D) is incorrect because The $392,000 option incorrectly calculates the after-tax cash inflow from the sale of the old equipment by multiplying the $380,000 disposal value by 1 minus the tax rate of 40%. This is incorrect because it ignores the effects of the tax gain on the transaction.
A project with a 4-year life has a cost of acquisition of $400,000 and installation cost of $100,000. If the effective income tax rate is 40%, what is the cash inflow each period due to depreciation expense?

A. $40,000  
B. $50,000  
C. $60,000  
D. $75,000

- Answer (A) is incorrect because this answer ignores the capitalization of installation cost.  
- Answer (B) is correct. The total depreciable base is $500,000 over 4 years. Each year, a $125,000 depreciation charge will result in a depreciation tax shield of $50,000 ($125,000 × 0.40).  
- Answer (C) is incorrect because this answer ignores the capitalization of installation and calculates the tax shield by multiplying the depreciation charge by 1 minus the tax rate.  
- Answer (D) is incorrect because this answer calculates the depreciation tax shield by multiplying the depreciation charge by 1 minus the tax rate.

The net present value (NPV) method of investment project analysis assumes that the project’s cash flows are reinvested at the

A. Computed internal rate of return.  
B. Risk-free interest rate.  
C. Discount rate used in the NPV calculation.  
D. Firm’s accounting rate of return.

- Answer (A) is incorrect because the internal rate of return method assumes that cash flows are reinvested at the internal rate of return.  
- Answer (B) is incorrect because the NPV method assumes that cash flows are reinvested at the NPV discount rate.  
- Answer (C) is correct. The NPV method is used when the discount rate is specified. It assumes that cash flows from the investment can be reinvested at the particular project’s discount rate.  
- Answer (D) is incorrect because the NPV method assumes that cash flows are reinvested at the NPV discount rate.

The rankings of mutually exclusive investments determined using the internal rate of return method (IRR) and the net present value method (NPV) may be different when

A. The lives of the multiple projects are equal and the size of the required investments are equal.  
B. The required rate of return equals the IRR of each project.  
C. The required rate of return is higher than the IRR of each project.  
D. Multiple projects have unequal lives and the size of the investment for each project is different.

- Answer (A) is incorrect because the two methods will give the same results if the lives and required investments are the same.  
- Answer (B) is incorrect because if the required rate of return equals the IRR, the two methods will yield the same decision.  
- Answer (C) is incorrect because if the required rate of return is higher than the IRR, both methods will yield a decision not to acquire the investment.
Answer (D) is correct. The two methods ordinarily yield the same results, but differences can occur when the duration of the projects and the initial investments differ. The reason is that the IRR method assumes cash inflows from the early years will be reinvested at the internal rate of return. The NPV method assumes that early cash inflows are reinvested at the NPV discount rate.

[Fact Pattern #154]
A firm with an 18% desired rate of return is considering the following projects (on January 1, Year 1):

<table>
<thead>
<tr>
<th>January 1, Year 1</th>
<th>December 31, Year 5</th>
<th>Project Internal Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash Outflow (000's Omitted)</td>
<td>Cash Inflow (000's Omitted)</td>
<td></td>
</tr>
<tr>
<td>Project A</td>
<td>$3,500</td>
<td>$7,400</td>
</tr>
<tr>
<td>Project B</td>
<td>4,000</td>
<td>9,950</td>
</tr>
</tbody>
</table>

Present Value of $1 Due at the End of N Periods

<table>
<thead>
<tr>
<th>N</th>
<th>12%</th>
<th>14%</th>
<th>15%</th>
<th>16%</th>
<th>18%</th>
<th>20%</th>
<th>22%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>.6355</td>
<td>.5921</td>
<td>.5718</td>
<td>.5523</td>
<td>.5158</td>
<td>.4823</td>
<td>.4230</td>
</tr>
<tr>
<td>5</td>
<td>.5674</td>
<td>.5194</td>
<td>.4972</td>
<td>.4761</td>
<td>.4371</td>
<td>.4019</td>
<td>.3411</td>
</tr>
<tr>
<td>6</td>
<td>.5066</td>
<td>.4556</td>
<td>.4323</td>
<td>.4104</td>
<td>.3704</td>
<td>.3349</td>
<td>.2751</td>
</tr>
</tbody>
</table>

Using the net-present-value (NPV) method, Project A’s net present value is

A. $316,920  
B. $23,140  
C. $(265,460)  
D. $(316,920)

Answer (A) is incorrect because The amount of $316,920 discounts the cash inflow over a 4-year period.  
Answer (B) is incorrect because The amount of $23,140 assumes a 16% discount rate.  
Answer (C) is correct. The cash inflow occurs 5 years after the cash outflow, and the NPV method uses the firm’s desired rate of return of 18%. The present value of $1 due at the end of 5 years discounted at 18% is .4371. Thus, the NPV of Project A is $(265,460) [(7,400,000 cash inflow × .4371) – $3,500,000 cash outflow].  
Answer (D) is incorrect because The amount of $(316,920) discounts the cash inflow over a 4-year period and also subtracts the present value of the cash inflow from the cash outflow.

Project B’s internal rate of return is closest to

A. 15%  
B. 16%  
C. 18%  
D. 20%

Answer (A) is incorrect because This percentage results in a positive NPV for Project B.
• Answer (B) is incorrect because this percentage is the approximate internal rate of return for Project A.
• Answer (C) is incorrect because this percentage is the company’s cost of capital.
• Answer (D) is correct. The internal rate of return is the discount rate at which the NPV is zero. Consequently, the cash outflow equals the present value of the inflow at the internal rate of return. The present value of $1 factor for Project B’s internal rate of return is therefore .4020 ($4,000,000 cash outflow ÷ $9,950,000 cash inflow). This factor is closest to the present value of $1 for 5 periods at 20%.

Amster Corporation has not yet decided on its hurdle rate for use in the evaluation of capital budgeting projects. This lack of information will prohibit Amster from calculating a project’s

<table>
<thead>
<tr>
<th>Accounting Rate of Return</th>
<th>Net Present Value</th>
<th>Internal Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>B. Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>C. No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>D. No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

• Answer (A) is incorrect because The accounting rate of return and the IRR, but not the NPV, can be calculated without knowing the hurdle rate.
• Answer (B) is incorrect because The accounting rate of return and the IRR, but not the NPV, can be calculated without knowing the hurdle rate.
• Answer (C) is incorrect because The accounting rate of return and the IRR, but not the NPV, can be calculated without knowing the hurdle rate.
• Answer (D) is correct. A hurdle rate is not necessary in calculating the accounting rate of return. That return is calculated by dividing the net income from a project by the investment in the project. Similarly, a company can calculate the internal rate of return (IRR) without knowing its hurdle rate. The IRR is the discount rate at which the net present value is $0. However, the NPV cannot be calculated without knowing the company’s hurdle rate. The NPV method requires that future cash flows be discounted using the hurdle rate.

All of the following items are included in discounted cash flow analysis except

A. Future operating cash savings.
B. The current asset disposal price.
C. The future asset depreciation expense.
D. The tax effects of future asset depreciation.

• Answer (A) is incorrect because Future operating cash savings is a consideration in discounted cash flow analysis.
• Answer (B) is incorrect because The current asset disposal price is a consideration in discounted cash flow analysis.
• Answer (C) is correct. Discounted cash flow analysis, using either the internal rate of return (IRR) or the net present value (NPV) method, is based on the time value of cash inflows and outflows. All future operating cash savings are considered, as well as the tax effects on cash flows of future depreciation charges. The cash proceeds of future asset disposals are likewise a necessary consideration. Depreciation expense is a consideration only to the extent that it affects the cash flows for taxes. Otherwise, depreciation is excluded from the analysis because it is a noncash expense.
• Answer (D) is incorrect because The tax effects of future asset depreciation is a consideration in discounted cash flow analysis.
The use of an accelerated method instead of the straight-line method of depreciation in computing the net present value of a project has the effect of

A. Raising the hurdle rate necessary to justify the project.
B. Lowering the net present value of the project.
C. Increasing the present value of the depreciation tax shield.
D. Increasing the cash outflows at the initial point of the project.

- Answer (A) is incorrect because the hurdle rate can be reached more easily as a result of the increased present value of the depreciation tax shield.
- Answer (B) is incorrect because the greater depreciation tax shield increases the NPV.
- Answer (C) is correct. Accelerated depreciation results in greater depreciation in the early years of an asset’s life compared with the straight-line method. Thus, accelerated depreciation results in lower income tax expense in the early years of a project and higher income tax expense in the later years. By effectively deferring taxes, the accelerated method increases the present value of the depreciation tax shield.
- Answer (D) is incorrect because greater initial depreciation reduces the cash outflows for the taxes, but has no effect on the initial cash outflows.

The NPV of a project has been calculated to be $215,000. Which one of the following changes in assumptions would decrease the NPV?

A. Decrease the estimated effective income tax rate.
B. Decrease the initial investment amount.
C. Extend the project life and associated cash inflows.
D. Increase the discount rate.

- Answer (A) is incorrect because a decrease in the tax rate would decrease tax expense, thus increasing cash flows and the NPV.
- Answer (B) is incorrect because a decrease in the initial investment amount would increase the NPV.
- Answer (C) is incorrect because an extension of the project life and associated cash inflows would increase the NPV.
- Answer (D) is correct. An increase in the discount rate would lower the net present value, as would a decrease in cash flows or an increase in the initial investment.

A disadvantage of the net present value method of capital expenditure evaluation is that it

A. Is calculated using sensitivity analysis.
B. Computes the true interest rate.
C. Does not provide the true rate of return on investment.
D. Is difficult to apply because it uses a trial-and-error approach.

- Answer (A) is incorrect because the ability to perform sensitivity analysis is an advantage of the NPV method.
- Answer (B) is incorrect because the NPV method does not compute the true interest rate.
Answer (C) is correct. The NPV is broadly defined as the excess of the present value of the estimated net cash inflows over the net cost of the investment. A discount rate has to be stipulated by the person conducting the analysis. A disadvantage is that it does not provide the true rate of return for an investment, only that the rate of return is higher than a stipulated discount rate (which may be the cost of capital).

Answer (D) is incorrect because the IRR method, not the NPV method, uses a trial-and-error approach when cash flows are not identical from year to year.

[Fact Pattern #155]
In order to increase production capacity, Gunning Industries is considering replacing an existing production machine with a new technologically improved machine effective January 1. The following information is being considered by Gunning Industries:

- The new machine would be purchased for $160,000 in cash. Shipping, installation, and testing would cost an additional $30,000.
- The new machine is expected to increase annual sales by 20,000 units at a sales price of $40 per unit. Incremental operating costs include $30 per unit in variable costs and total fixed costs of $40,000 per year.
- The investment in the new machine will require an immediate increase in working capital of $35,000. This cash outflow will be recovered after 5 years.
- Gunning uses straight-line depreciation for financial reporting and tax reporting purposes. The new machine has an estimated useful life of 5 years and zero salvage value.
- Gunning is subject to a 40% corporate income tax rate.

Gunning uses the net present value method to analyze investments and will employ the following factors and rates:

<table>
<thead>
<tr>
<th>Period</th>
<th>Present Value of $1 at 10%</th>
<th>Present Value of an Ordinary Annuity of $1 at 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.909</td>
<td>.909</td>
</tr>
<tr>
<td>2</td>
<td>.826</td>
<td>1.736</td>
</tr>
<tr>
<td>3</td>
<td>.751</td>
<td>2.487</td>
</tr>
<tr>
<td>4</td>
<td>.683</td>
<td>3.170</td>
</tr>
<tr>
<td>5</td>
<td>.621</td>
<td>3.791</td>
</tr>
</tbody>
</table>

[1436] Refers to Fact Pattern #155
Gunning Industries' net cash outflow in a capital budgeting decision is

A. $190,000
B. $195,000
C. $204,525
D. $225,000

- Answer (A) is incorrect because the amount of $190,000 ignores the investment in working capital.
- Answer (B) is incorrect because the amount of $195,000 ignores the $30,000 of shipping, installation, and testing costs.
- Answer (C) is incorrect because the amount of $204,525 is the present value of $225,000 at 10% for 1 year.
- Answer (D) is correct. The machine costs $160,000 and will require $30,000 to install and test. In addition, the company will have to invest in $35,000 of working capital to support the production of the new machine. Thus, the total investment necessary is $225,000.
Gunning Industries’ discounted annual depreciation tax shield for the year of replacement is

A. $13,817
B. $16,762
C. $20,725
D. $22,800

- Answer (A) is correct. Gunning uses straight-line depreciation. Thus, the annual charge is $38,000 [($160,000 + $30,000) ÷ 5 years], and the tax savings is $15,200 ($38,000 × 40%). That benefit will be received in 1 year, so the present value is $13,817 ($15,200 tax savings × .909 present value of $1 for 1 year at 10%).
- Answer (B) is incorrect because the amount of $16,762 is greater than the undiscounted tax savings.
- Answer (C) is incorrect because the amount of $20,725 assumes a 60% tax rate (the complement of the actual 40% rate).
- Answer (D) is incorrect because the amount of $22,800 assumes a 60% tax rate and no discounting.

The acquisition of the new production machine by Gunning Industries will contribute a discounted net-of-tax contribution margin of

A. $242,624
B. $303,280
C. $363,936
D. $454,920

- Answer (A) is incorrect because the amount of $242,624 deducts fixed costs from the pretax contribution margin and applies a 60% tax rate.
- Answer (B) is incorrect because the amount of $303,280 deducts fixed costs from the after-tax contribution margin before discounting.
- Answer (C) is incorrect because the amount of $363,936 deducts fixed costs from the contribution margin before calculating taxes and the present value.
- Answer (D) is correct. The new machine will increase sales by 20,000 units a year. The increase in the pretax total contribution margin will be $200,000 per year [20,000 units × ($40 SP – $30 VC)], and the annual increase in the after-tax contribution margin will be $120,000 [$200,000 × (1.0 – .4)]. The present value of the after-tax increase in the contribution margin over the 5-year useful life of the machine is $454,920 ($120,000 × 3.791 PV of an ordinary annuity for 5 years at 10%).

The overall discounted cash flow impact of Gunning Industries’ working capital investment for the new production machine would be

A. $(7,959)
B. $(10,080)
C. $(13,265)
D. $(35,000)
Answer (A) is incorrect because The amount of $(7,959) assumes the initial investment and its return are reduced by applying a 40% tax rate.

Answer (B) is incorrect because The amount of $(10,080) assumes the initial investment was discounted for 1 year.

Answer (C) is correct. The $35,000 of working capital requires an immediate outlay for that amount, but it will be recovered in 5 years. Thus, the net discounted cash outflow is $13,265 [($35,000 initial investment – ($35,000 future inflow × .621 PV of $1 for 5 years at 10%)].

Answer (D) is incorrect because The amount of $(35,000) fails to consider that the $35,000 will be recovered (essentially in the form of a salvage value) after the fifth year.

Jackson Corporation uses net present value techniques in evaluating its capital investment projects. The company is considering a new equipment acquisition that will cost $100,000, fully installed, and have a zero salvage value at the end of its five-year productive life. Jackson will depreciate the equipment on a straight-line basis for both financial and tax purposes. Jackson estimates $70,000 in annual recurring operating cash income and $20,000 in annual recurring operating cash expenses. Jackson’s desired rate of return is 12% and its effective income tax rate is 40%. What is the net present value of this investment on an after-tax basis?

A. $28,840  
B. $8,150  
C. $36,990  
D. $80,250

Answer (A) is incorrect because The amount of $28,840 is the present value of the depreciation tax savings.

Answer (B) is incorrect because The amount of $8,150 ignores the depreciation tax savings.

Answer (C) is correct. Annual cash outflow for taxes is $12,000 [($70,000 inflows – $20,000 cash operating expenses – ($100,000 ÷ 5) depreciation] × 40%). The annual net cash inflow is therefore $38,000 ($70,000 – $20,000 – $12,000). The present value of these net inflows for a 5-year period is $136,990 ($38,000 × 3.605 present value of an ordinary annuity for 5 years at 12%), and the NPV of the investment is $36,990 ($136,990 – $100,000 investment).

Answer (D) is incorrect because The amount of $80,250 ignores taxes.

A weakness of the internal rate of return (IRR) approach for determining the acceptability of investments is that it

A. Does not consider the time value of money.  
B. Is not a straightforward decision criterion.  
C. Implicitly assumes that the firm is able to reinvest project cash flows at the firm’s cost of capital.  
D. Implicitly assumes that the firm is able to reinvest project cash flows at the project’s internal rate of return.

Answer (A) is incorrect because The IRR method considers the time value of money.

Answer (B) is incorrect because The IRR provides a straightforward decision criterion. Any project with an IRR greater than the firm’s desired rate of return is acceptable.

Answer (C) is incorrect because The IRR method implicitly assumes reinvestment at the IRR; the NPV method implicitly assumes reinvestment at the cost of capital.

Answer (D) is correct. The IRR is the rate at which the discounted future cash flows equal the net investment (NPV = 0). One disadvantage of the method is that inflows from the early years are assumed to be reinvested at the IRR. This assumption may not be sound. Investments in the future may not earn as high a rate as is currently available.
The internal rate of return (IRR) is the

A. Hurdle rate.
B. Rate of interest for which the net present value is greater than 1.0.
C. Rate of interest for which the net present value is equal to zero.
D. Rate of return generated from the operational cash flows.

- Answer (A) is incorrect because The hurdle rate is a concept used to calculate the NPV of a project; it is determined by management prior to the analysis.
- Answer (B) is incorrect because The IRR is the rate of interest at which the NPV is zero.
- Answer (C) is correct. The IRR is the interest rate at which the present value of the expected future cash inflows is equal to the present value of the cash outflows for a project. Thus, the IRR is the interest rate that will produce a net present value (NPV) equal to zero. The IRR method assumes that the cash flows will be reinvested at the internal rate of return.
- Answer (D) is incorrect because The IRR is a means of evaluating potential investment projects.

Suzie owns a computer reselling business and is expanding it. She is presented with two options. Under Proposal A, the estimated investment for the expansion project is $85,000, and it is expected to produce after-tax cash flows of $25,000 for each of the next 6 years. Proposal B involves an investment of $32,000 and after-tax cash flows of $10,000 for each of the next 6 years. Between which two desired rates of return will Suzie be indifferent to either proposal?

A. 10% and 12%.
B. 14% and 16%.
C. 16% and 18%.
D. 18% and 20%.

- Answer (A) is incorrect because Proposal A is superior.
- Answer (B) is incorrect because Proposal A is superior.
- Answer (C) is correct. The desired rate of return at which the two projects will produce the same NPV can be found by calculating the IRR of the difference in cash flows between the two projects. Proposal A requires an additional investment of $53,000 and generates extra cash flows of $15,000 for 6 years. Dividing the incremental investment by the annual cash flows yields a result of 3.533 ($53,000 ÷ $15,000). In other words, this is the present value factor necessary to make the cash flows equal the incremental investment. Consulting the present value table for an ordinary annuity for 6 years reveals that 3.533 is somewhere between 16% and 18%.
- Answer (D) is incorrect because Proposal B is superior. Proposal A has a negative NPV with regard to the incremental cash flows.

The net present value method of capital budgeting assumes that cash flows are reinvested at

A. The risk-free rate.
B. The cost of debt.
C. The rate of return of the project.
D. The discount rate used in the analysis.

- Answer (A) is incorrect because The NPV method assumes that cash inflows are reinvested at the discount rate used in the NPV calculation.
- Answer (B) is incorrect because The cost of debt may or may not reflect the firm’s actual cost of capital.
Answer (C) is incorrect because the internal rate of return method assumes a reinvestment rate equal to the rate of return on the project.

Answer (D) is correct. The NPV method assumes that periodic cash inflows earned over the life of an investment are reinvested at the company's cost of capital (i.e., the discount rate used in the analysis). This is contrary to the assumption under the internal rate of return method, which assumes that cash inflows are reinvested at the internal rate of return. As a result of this difference, the two methods will occasionally give different rankings of investment alternatives.

The net present value of a proposed investment is negative; therefore, the discount rate used must be

A. Greater than the project’s internal rate of return.
B. Less than the project’s internal rate of return.
C. Greater than the firm’s cost of equity.
D. Less than the risk-free rate.

Answer (A) is correct. The higher the discount rate, the lower the NPV. The IRR is the discount rate at which the NPV is zero. Consequently, if the NPV is negative, the discount rate used must exceed the IRR.

Answer (B) is incorrect because if the discount rate is less than the IRR, the NPV is positive.

Answer (C) is incorrect because the NPV measures the difference between a company’s discount rate and the IRR.

Answer (D) is incorrect because the relationship between the discount rate and the risk-free rate is not a factor in investment analysis under the NPV method.

Dr. G invested $10,000 in a lifetime annuity for his granddaughter Emily. The annuity is expected to yield $400 annually forever. What is the anticipated internal rate of return for the annuity?

A. Cannot be determined without additional information.
B. 4.0%
C. 2.5%
D. 8.0%

Answer (A) is incorrect because the IRR can be calculated.

Answer (B) is correct. The correct answer is 4.0%. $10,000 = $400 ÷ IRR; IRR = 0.040 = 4.0%.

Answer (C) is incorrect because the IRR is 4.0%.

Answer (D) is incorrect because the IRR is 4.0%.

Which of the following statements is most likely correct for a project costing $50,000 and returning $14,000 per year for 5 years?

A. NPV = $36,274.
B. NPV = $20,000.
C. IRR = 1.4%.
D. IRR is greater than 10%.

Answer (A) is incorrect because it is impossible for the NPV to be greater than $20,000, regardless of the discount rate used.
Answer (B) is incorrect because the total cash inflows are only $70,000 (5 × $14,000). Thus, whatever the discount rate, the NPV will be less than $20,000 ($70,000 – $50,000).

Answer (C) is incorrect because the IRR is greater.

Answer (D) is correct. The total cash inflows are only $70,000 (5 × $14,000). Thus, whatever the discount rate, the NPV will be less than $20,000 ($70,000 – $50,000). The return in the first year is $14,000, or 28% of the initial investment. Since the same $14,000 flows in each year, the IRR is going to be greater than 10% (actually, it is almost 14%).

What is the approximate IRR for a project that costs $50,000 and provides cash inflows of $20,000 for 3 years?

A. 10%
B. 12%
C. 22%
D. 27%

- Answer (A) is correct. The factor to use is 2.5, which is found at a little under 10% on the 3-year line of an annuity table.
- Answer (B) is incorrect because discounting the cash inflows at 12% would not produce a NPV of zero.
- Answer (C) is incorrect because discounting the cash inflows at 22% would not produce a NPV of zero.
- Answer (D) is incorrect because discounting the cash inflows at 27% would not produce a NPV of zero.

Pena Company is considering a project that calls for an initial cash outlay of $50,000. The expected net cash inflows from the project are $7,791 for each of 10 years. What is the IRR of the project?

A. 6%
B. 7%
C. 8%
D. 9%

- Answer (A) is incorrect because discounting the cash inflows at 6% would not produce a NPV of zero.
- Answer (B) is incorrect because discounting the cash inflows at 7% would not produce a NPV of zero.
- Answer (C) is incorrect because discounting the cash inflows at 8% would not produce a NPV of zero.
- Answer (D) is correct. The IRR can be calculated by equating the initial cash outlay with the present value of the net cash inflows:

\[
\frac{50,000}{7,791} = 6.418
\]

Using a PV table, 6.418 is PV at 9% for 10 periods.
The following forecasts have been prepared for a new investment by Oxford Industries of $20 million with an 8-year life:

<table>
<thead>
<tr>
<th></th>
<th>Pessimistic</th>
<th>Expected</th>
<th>Optimistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size</td>
<td>60,000</td>
<td>90,000</td>
<td>140,000</td>
</tr>
<tr>
<td>Market share, %</td>
<td>25</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>Unit price</td>
<td>$750</td>
<td>$800</td>
<td>$875</td>
</tr>
<tr>
<td>Unit variable cost</td>
<td>$500</td>
<td>$400</td>
<td>$350</td>
</tr>
<tr>
<td>Fixed cost, millions</td>
<td>$7</td>
<td>$4</td>
<td>$3.5</td>
</tr>
</tbody>
</table>

Assume that Oxford employs straight-line depreciation, and that they are taxed at 35%. Assuming an opportunity cost of capital of 14%, what is the NPV of this project, based on expected outcomes?

A. $2,626,415
B. $4,563,505
C. $6,722,109
D. $8,055,722

- Answer (A) is incorrect because the amount of $2,626,415 used the wrong discount factor.
- Answer (B) is correct. The first step is to calculate the annual cash flows from the project for the base case (the expected values). These may be calculated as shown:

<table>
<thead>
<tr>
<th>Description</th>
<th>How calculated</th>
<th>Value ($ in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Revenues</td>
<td>90,000 × 0.30 × $800</td>
<td>21.600</td>
</tr>
<tr>
<td>2. Variable cost</td>
<td>90,000 × 0.30 × $400</td>
<td>10.800</td>
</tr>
<tr>
<td>3. Fixed cost</td>
<td>$4,000,000</td>
<td>4.000</td>
</tr>
<tr>
<td>4. Depreciation</td>
<td>$20,000,000 ÷ 8</td>
<td>2.500</td>
</tr>
<tr>
<td>5. Pretax profit</td>
<td>Item 1 – (Items 2 + 3 + 4)</td>
<td>4.300</td>
</tr>
<tr>
<td>6. Tax</td>
<td>Item 5 × 0.35</td>
<td>1.505</td>
</tr>
<tr>
<td>7. Net profit</td>
<td>Item 5 – Item 6</td>
<td>2.795</td>
</tr>
<tr>
<td>8. Net cash flow</td>
<td>Item 7 + Item 4</td>
<td>5.295</td>
</tr>
</tbody>
</table>

This level of cash flow occurs for each of the 8 years of the project. The present value of an 8-year, $1 annuity is 4.639 at 14%. The NPV of the project is therefore given by:

\[ NPV = 5,295,000 \times 4.639 - 20,000,000 = 4,563,505 \]

- Answer (C) is incorrect because it failed to consider depreciation.
- Answer (D) is incorrect because it failed to consider depreciation and other fixed costs.

[Drillers, Inc., is evaluating a project to produce a high-tech deep-sea oil exploration device. The investment required is $80 million for a plant with a capacity of 15,000 units a year for 5 years. The device will be sold for a price of $12,000 per unit. Sales are expected to be 12,000 units per year. The variable cost is $7,000 and fixed costs, excluding depreciation, are $25 million per year. Assume Drillers employs straight-line depreciation on all depreciable assets, and assume that they are taxed at a rate of 36%. If the required rate of return is 12%, what is the approximate NPV of the project?

A. $17,225,000
B. $21,511,000
C. $26,780,000
D. $56,124,800

- Answer (A) is incorrect because it failed to consider depreciation.
• Answer (A) is incorrect because the amount of $17,225,000 results from failing to deduct depreciation in calculating taxes.
• Answer (B) is correct. The following table derives the cash flows and NPV.

<table>
<thead>
<tr>
<th>Item</th>
<th>Year 0 (80,000,000)</th>
<th>Years 1 to 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(80,000,000)</td>
<td></td>
</tr>
<tr>
<td>Revenue</td>
<td>$144,000,000</td>
<td></td>
</tr>
<tr>
<td>Variable cost</td>
<td>84,000,000</td>
<td></td>
</tr>
<tr>
<td>Fixed cost</td>
<td>25,000,000</td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td>16,000,000</td>
<td></td>
</tr>
<tr>
<td>Pre-tax profit</td>
<td>19,000,000</td>
<td></td>
</tr>
<tr>
<td>Tax @ 36%</td>
<td>6,840,000</td>
<td></td>
</tr>
<tr>
<td>Net profit</td>
<td>12,160,000</td>
<td></td>
</tr>
<tr>
<td>Net cash flow</td>
<td>28,160,000</td>
<td></td>
</tr>
<tr>
<td>Present value (12% × 28,160,000 × 3.605)</td>
<td>101,516,800</td>
<td></td>
</tr>
</tbody>
</table>

NPV = $21,516,800

• Answer (C) is incorrect because the amount of $26,780,000 results from failing to consider that depreciation is a noncash expense.
• Answer (D) is incorrect because the amount of $56,124,800 is based on annual sales of 15,000 units, rather than 12,000 units.

Assume that the probability distribution of NPVs is normal. The firm considers true risk occurring if the project results in a NPV that is zero or less. If the expected NPV is $1,000 and the standard deviation of NPV is $500, what is the probability that the project has an NPV of 0 or less?

A. Less than 3%.
B. Greater than 3%, but less than 9%.
C. Greater than 9%, but less than 16%.
D. Greater than 16%.

• Answer (A) is correct. Since three standard deviations incorporate over 99% of all observations, and two standard deviations incorporate over 95% of observations, less than 5% will not be included within two standard deviations, and this is divided between both ends of the normal curve. Therefore, less than 2.5% of the observations will be in the negative portion of the curve.
• Answer (B) is incorrect because the 5% of observations not covered within two standard deviations are divided between the two tails of the curve.
• Answer (C) is incorrect because the 5% of observations not covered within two standard deviations are divided between the two tails of the curve.
• Answer (D) is incorrect because the 5% of observations not covered within two standard deviations are divided between the two tails of the curve.
Project 1 has an expected NPV of $120,000 and a standard deviation of $200,000. Project 2 has an expected NPV of $100,000 and a standard deviation of $150,000. The correlation between these two projects is 0.80. What is the coefficient of variation for the portfolio of projects?

A. 1.67
B. 1.59
C. 1.51
D. 0.63

- Answer (A) is incorrect because this figure is for Project 1 only.
- Answer (B) is incorrect because this figure assumes a correlation of 1.0.
- Answer (C) is correct. The coefficient of variation is useful when the rates of return and standard deviations of two investments differ. It measures the risk per unit of return by dividing the standard deviation by the expected return. Thus, for Project 1, dividing $200,000 by $120,000 produces a coefficient of 1.67. For Project 2, the calculation is to divide $150,000 by $100,000, or 1.50. If the two projects had perfect correlation (=1.0), then you could combine the calculations ($350,000 ÷ $220,000 = 1.59). However, with a correlation of less than one, the risk will be something less than 1.59.
- Answer (D) is incorrect because this figure is the inverse of the unadjusted portfolio coefficient.

When using the net present value method for capital budgeting analysis, the required rate of return is called all of the following except the

A. Risk-free rate.
B. Cost of capital.
C. Discount rate.
D. Cutoff rate.

- Answer (A) is correct. The rate used to discount future cash flows is sometimes called the cost of capital, the discount rate, the cutoff rate, or the hurdle rate. A risk-free rate is the rate available on risk-free investments such as government bonds. The risk-free rate is not equivalent to the cost of capital because the latter must incorporate a risk premium.
- Answer (B) is incorrect because the rate used under the NPV method is the company’s cost of capital.
- Answer (C) is incorrect because the NPV method discounts future cash flows to their present values.
- Answer (D) is incorrect because the cost of capital is often called a cutoff rate. Investments yielding less than the cost of capital should not be made.

The internal rate of return for a project can be determined

A. If the internal rate of return is greater than the firm’s cost of capital.
B. Only if the project cash flows are constant.
C. By finding the discount rate that yields a net present value of zero for the project.
D. By subtracting the firm’s cost of capital from the project’s profitability index.

- Answer (A) is incorrect because the cost of capital is not used in the calculation of the IRR.
- Answer (B) is incorrect because the IRR can be determined regardless of the constancy of the cash flows. However, it is more difficult to calculate when cash flows are not constant because a trial-and-error approach must be used.
- Answer (C) is correct. The IRR is a capital budgeting technique that calculates the interest rate that yields a net present value equal to $0. It is the interest rate that will discount the future cash flows to an amount equal to the initial cost of the project. Thus, the higher the IRR, the more favorable the ranking of the project.
Answer (D) is incorrect because there is no relationship between IRR and the profitability index.

Carco, Inc., wants to use discounted cash flow techniques when analyzing its capital investment projects. The company is aware of the uncertainty involved in estimating future cash flows. A simple method some companies employ to adjust for the uncertainty inherent in their estimates is to

A. Prepare a direct analysis of the probability of outcomes.
B. Use accelerated depreciation.
C. Adjust the minimum desired rate of return.
D. Increase the estimates of the cash flows.

Answer (A) is incorrect because preparing an analysis of probability of outcomes is not a simple method of adjustment.
Answer (B) is incorrect because accelerated depreciation should probably be used for tax purposes in every capital project to minimize taxes in early years.
Answer (C) is correct. Uncertainty can be compensated for by adjusting the desired rate of return. If projects have relatively uncertain returns, a higher rate should be required. A lower rate of return may be acceptable given greater certainty. The concept is that with increased risk should come increased rewards, i.e., a higher rate of return.
Answer (D) is incorrect because uniformly increasing the estimated cash flows and/or ignoring salvage values introduces error into the capital budgeting analysis.

The accountant of Ronier, Inc., has prepared an analysis of a proposed capital project using discounted cash flow techniques. One manager has questioned the accuracy of the results because the discount factors employed in the analysis have assumed the cash flows occurred at the end of the year when the cash flows actually occurred uniformly throughout each year. The net present value calculated by the accountant will

A. Not be in error.
B. Be slightly overstated.
C. Be unusable for actual decision making.
D. Be slightly understated but usable.

Answer (A) is incorrect because cash flows in investment decisions do not all occur at the end of each year.
Answer (B) is incorrect because discounting cash flows approximately 6 months longer understates rather than overstates.
Answer (C) is incorrect because the effect of using the year-end assumption produces a slight conservatism in the model but does not render the results unusable.
Answer (D) is correct. The effect of assuming cash flows occur at the end of the year simply understates the present values of the future cash flows; in reality, they probably occur on the average at mid-year.

The internal rate of return on an investment

A. Usually coincides with the company’s hurdle rate.
B. Disregards discounted cash flows.
C. May produce different rankings from the net present value method on mutually exclusive projects.
D. Would tend to be reduced if a company used an accelerated method of depreciation for tax purposes rather than the straight-line method.

Answer (A) is incorrect because the IRR is a number computed based on the characteristics of a given project.
Answer (B) is incorrect because Cash flows are discounted under the IRR method.

Answer (C) is correct. Investment projects may be mutually exclusive under conditions of capital rationing (limited capital). In other words, scarcity of resources will prevent an entity from undertaking all available profitable activities. Under the IRR method, an interest rate is computed such that the present value of the expected future cash flows equals the cost of the investment (NPV = 0). The IRR method assumes that the cash flows will be reinvested at the IRR. The NPV is the excess of the present value of the estimated net cash inflows over the net cost of the investment. The cost of capital must be specified in the NPV method. An assumption of the NPV method is that cash flows from the investment will be reinvested at the particular project’s cost of capital. Because of the difference in the assumptions regarding the reinvestment of cash flows, the two methods will occasionally give different answers regarding the ranking of mutually exclusive projects. Moreover, the IRR method may rank several small, short-lived projects ahead of a large project with a lower rate of return but with a longer life span. However, the large project might return more dollars to the company because of the larger amount invested and the longer time span over which earnings will accrue. When faced with capital rationing, an investor will want to invest in projects that generate the most dollars in relation to the limited resources available and the size and returns from the possible investments. Thus, the NPV method should be used because it determines the aggregate present value for each feasible combination of projects.

Answer (D) is incorrect because An accelerated depreciation method will generate larger net cash inflows in the early years of a project. To equate the present value of these cash flows with the net investment will therefore require a higher discount rate (IRR).

The internal rate of return is

- The breakeven borrowing rate for the project in question.
- The yield rate/effective rate of interest quoted on long-term debt and other instruments.
- Favorable when it exceeds the hurdle rate.
- All of the answers are correct.

Answer (A) is incorrect because The IRR is the discount rate at which the NPV of the cash flows is zero, the breakeven borrowing rate for the project in question, the yield rate/effective rate of interest quoted on long-term debt and other instruments, and favorable when it exceeds the hurdle rate.

Answer (B) is incorrect because The IRR is the discount rate at which the NPV of the cash flows is zero, the breakeven borrowing rate for the project in question, the yield rate/effective rate of interest quoted on long-term debt and other instruments, and favorable when it exceeds the hurdle rate.

Answer (C) is incorrect because The IRR is the discount rate at which the NPV of the cash flows is zero, the breakeven borrowing rate for the project in question, the yield rate/effective rate of interest quoted on long-term debt and other instruments, and favorable when it exceeds the hurdle rate.

Answer (D) is correct. The internal rate of return (IRR) is the discount rate at which the present value of the cash flows equals the original investment. Thus, the NPV of the project is zero at the IRR. The IRR is also the maximum borrowing cost the firm could afford to pay for a specific project. The IRR is similar to the yield rate/effective rate quoted in the business media.

All of the following are the rates used in net present value analysis except for the

- Cost of capital.
- Hurdle rate.
- Discount rate.
- Accounting rate of return.

Answer (A) is incorrect because Cost of capital is a synonym for the rate used in NPV analysis.

Answer (B) is incorrect because Hurdle rate is a synonym for the rate used in NPV analysis.
Answer (C) is incorrect because Discount rate is a synonym for the rate used in NPV analysis.

Answer (D) is correct. The NPV is the excess of the present values of the estimated cash inflows over the net cost of the investment. The discount rate used is sometimes the cost of capital or other hurdle rate designated by management. This rate is also called the required rate of return. The accounting rate of return is never used in NPV analysis because it ignores the time value of money; it is computed by dividing the accounting net income by the investment.

In evaluating a capital budget project, the use of the net present value (NPV) model is generally not affected by the

- Method of funding the project.
- Initial cost of the project.
- Amount of added working capital needed for operations during the term of the project.
- Project’s salvage value.

- Answer (A) is correct. The NPV method computes the present value of future cash inflows to determine whether they are greater than the initial cash outflow. Future cash inflows include any salvage value on facilities. Included in the initial investment are the cost of new equipment and other facilities, and additional working capital needed for operations during the term of the project. The discount rate (cost of capital or hurdle rate) must be known to discount the future cash inflows. If the NPV is positive, the project should be accepted. The method of funding a project is a decision separate from that of whether to invest.
- Answer (B) is incorrect because the initial costs of the project are necessary to determine the NPV.
- Answer (C) is incorrect because additional working capital needs are necessary to determine the NPV.
- Answer (D) is incorrect because the project’s salvage value is a future cash inflow to be discounted.

An advantage of the net present value method over the internal rate of return model in discounted cash flow analysis is that the net present value method

- Computes a desired rate of return for capital projects.
- Can be used when there is no constant rate of return required for each year of the project.
- Uses a discount rate that equates the discounted cash inflows with the outflows.
- Uses discounted cash flows whereas the internal rate of return model does not.

- Answer (A) is incorrect because the IRR method calculates a rate of return.
- Answer (B) is correct. The NPV method calculates the present values of estimated future net cash inflows and compares the total with the net cost of the investment. The cost of capital must be specified. If the NPV is positive, the project should be accepted. The IRR method computes the interest rate at which the NPV is zero. The IRR method is relatively easy to use when cash inflows are the same from one year to the next. However, when cash inflows differ from year to year, the IRR can be found only through the use of trial and error. In such cases, the NPV method is usually easier to apply. Also, the NPV method can be used when the rate of return required for each year varies. For example, a company might want to achieve a higher rate of return in later years when risk might be greater. Only the NPV method can incorporate varying levels of rates of return.
- Answer (C) is incorrect because the IRR is the rate at which NPV is zero.
- Answer (D) is incorrect because both methods discount cash flows.
Basic time value of money concepts concern

<table>
<thead>
<tr>
<th>Interest Factors</th>
<th>Risk</th>
<th>Cost of capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>B. Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>C. No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>D. No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- Answer (A) is **correct**. The time value of money is concerned with two issues: (1) the investment value of money, and (2) the risk (uncertainty) inherent in any executory agreement. Thus, a dollar today is worth more than a dollar in the future, and the longer one waits for a dollar, the more uncertain the receipt is. The cost of capital involves a specific application of the time value of money principles. It is not a basic concept thereof.
- Answer (B) is incorrect because Risk is a basic time value of money concept. Cost of capital is not.
- Answer (C) is incorrect because The interest effect is a basic time value of money concept.
- Answer (D) is incorrect because The interest effect and risk are basic time value of money concepts. Cost of capital is not.

The present value may be calculated for discounted cash inflows outflows annuities

<table>
<thead>
<tr>
<th>Inflows</th>
<th>Outflows</th>
<th>Annuities</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>B. Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>C. No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>D. No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- Answer (A) is **correct**. The present value concept may be applied both to dollars-in (inflows) and to dollars-out (outflows). Thus, individual cash inflows and cash outflows or a series thereof (an annuity) may be discounted to time zero (the present). Net present value is the sum of discounted cash inflows minus any discounted cash outflows. Net present value may be either positive or negative.
- Answer (B) is incorrect because A present value may be calculated for discounted cash outflows.
- Answer (C) is incorrect because A present value may be calculated for discounted cash inflows or a series thereof (an annuity).
- Answer (D) is incorrect because A present value may be calculated for discounted cash inflows or outflows.

Assume that the interest rate is greater than zero. Which of the following cash-inflow streams should you prefer?

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. $400</td>
<td>$300</td>
<td>$200</td>
<td>$100</td>
</tr>
<tr>
<td>B. $100</td>
<td>$200</td>
<td>$300</td>
<td>$400</td>
</tr>
<tr>
<td>C. $250</td>
<td>$250</td>
<td>$250</td>
<td>$250</td>
</tr>
<tr>
<td>D. Any of these, since they each sum to $1,000.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Answer (A) is **correct**. The concept of present value gives greater value to inflows received earlier in the stream. Thus, the declining inflows would be superior to increasing inflows, or even inflows.
- Answer (B) is incorrect because The cash flow shown does not produce the greatest present value.
Answer (C) is incorrect because the cash flow shown does not produce the greatest present value.

Answer (D) is incorrect because present value of the cash flows must be considered.

Wilkinson, Inc., which has a cost of capital of 12%, invested in a project with an internal rate of return (IRR) of 14%. The project is expected to have a useful life of four years, and it will produce net cash inflows as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Cash Inflows</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,000</td>
</tr>
<tr>
<td>2</td>
<td>2,000</td>
</tr>
<tr>
<td>3</td>
<td>4,000</td>
</tr>
<tr>
<td>4</td>
<td>4,000</td>
</tr>
</tbody>
</table>

The initial cost of this project amounted to:

A. $7,483
B. $8,530
C. $11,000
D. $12,540

Answer (A) is correct. The internal rate of return (IRR) of a capital project is the rate at which the net present value (NPV) of its future cash flows equals zero. To find this project’s NPV, therefore, it is necessary to discount the cash flows at the appropriate rate (14%) as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Cash Inflows</th>
<th>PV Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,000</td>
<td>0.877</td>
<td>$877</td>
</tr>
<tr>
<td>2</td>
<td>2,000</td>
<td>0.769</td>
<td>1,538</td>
</tr>
<tr>
<td>3</td>
<td>4,000</td>
<td>0.675</td>
<td>2,700</td>
</tr>
<tr>
<td>4</td>
<td>4,000</td>
<td>0.592</td>
<td>2,368</td>
</tr>
</tbody>
</table>

$7,483

Answer (B) is incorrect because the amount of $8,530 results from treating the cash inflows as occurring at the beginning of the year instead of at year end.

Answer (C) is incorrect because the amount of $11,000 results from failing to take the time value of money into account.

Answer (D) is incorrect because the amount of $12,540 results from multiplying times the 14% rate rather than discounting by that rate.
Gibber Corporation has an opportunity to sell a newly developed product in the United States for a period of 5 years. The product license would be purchased from NewGroup Company. Gibber would be responsible for all distribution and product promotion costs. NewGroup has the option to renew the agreement, with modifications, at the end of the initial 5-year term. Gibber has developed the following estimated revenues and costs that would be associated with the new product:

- Cost of new equipment required: $120,000
- Additional working capital required: $200,000
- Salvage value of equipment in Year 5: $20,000

Annual revenues and costs:
- Sales revenues: $400,000
- Costs of goods sold: $250,000
- Out-of-pocket operating cost: $70,000

The working capital required to support the new product would be released for investment elsewhere if the product licensing agreement is not renewed.

Using the net present value method of analysis and ignoring the effects of income taxes, the net present value of this product agreement, assuming Gibber has a 20% cost of capital, would be:

A. $7,720
B. $(64,064)
C. $(72,680)
D. $(127,320)

Answer (A) is correct. The net present value of a capital project is derived by calculating three amounts and discounting them at the appropriate interest rate: the net initial investment (for which the rate is always 0%), the annual cash inflows, and the termination cash inflows.

The net initial investment itself consists of three components: the purchase of new equipment, the increase in working capital, and the proceeds from the disposal of any old equipment. For this project, this amount is $320,000 ($120,000 + 200,000 + $0). Since this amount is paid out today, its present value is $320,000, i.e., no discounting is performed.

The second element of the project as a whole is the annual cash inflows. This has two components: the cash inflows from operations and the depreciation tax shield arising from the purchase of new equipment. Since the effects of income taxes are not relevant to this problem, only the first of these components requires calculation. The annual net operating revenue is $80,000 ($400,000 – $250,000 – $70,000). Discounted as an ordinary annuity for 5 years at 20%, its present value is $239,280 ($80,000 × 2.991).

The third and final element is the cash flows upon termination of the project, consisting of the proceeds from the disposal of the equipment involved in the project (again, the effects of income taxes are ignored for this problem) and the recovery of working capital. For this project, this amount is $220,000 ($20,000 + $200,000). Discounted as a single amount to be received in 5 years at 20%, its present value is $88,440 ($220,000 × 0.402).

Gibber’s total net present value for this capital project can therefore be calculated as follows:

Net initial investment: $(320,000)
Annual cash inflows: 239,280
Termination cash inflows: 88,440
Net present value: $7,720

Answer (B) is incorrect because the amount of $(64,064) results from improperly netting the cash flows with the recovery of working capital and the cash flows without the recovery of working capital.

Answer (C) is incorrect because the amount of $(72,680) results from failing to account for the recovery of working capital upon completion of the project.

Answer (D) is incorrect because the amount of $(127,320) results from reversing all the signs and neglecting to account for both the commitment and the recovery of working capital.
Bennet, Inc., uses the net present value method to evaluate capital projects. Bennet’s required rate of return is 10%. Bennet is considering two mutually exclusive projects for its manufacturing business. Both projects require an initial outlay of $120,000 and are expected to have a useful life of four years. The projected after-tax cash flows associated with these projects are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Project X</th>
<th>Project Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$40,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>2</td>
<td>40,000</td>
<td>20,000</td>
</tr>
<tr>
<td>3</td>
<td>40,000</td>
<td>60,000</td>
</tr>
<tr>
<td>4</td>
<td>40,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Total</td>
<td>$160,000</td>
<td>$170,000</td>
</tr>
</tbody>
</table>

Assuming adequate funds are available, which of the following project options would you recommend that Bennet’s management undertake.

A. Project X only.
B. Project Y only.
C. Projects X and Y.
D. Neither project.

- Answer (A) is correct. The net present value of Project X can be determined using the present value factor for an annuity (3.170) because the cash flows are even over the life of the project. An ordinary annuity of $40,000 discounted at 10% for the next four years has a present value of $126,800. The cash inflows of Project Y are uneven and so must be discounted with individual factors for each of the four years as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Cash Inflows</th>
<th>PV Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$10,000</td>
<td>0.909</td>
<td>$9,090</td>
</tr>
<tr>
<td>2</td>
<td>20,000</td>
<td>0.826</td>
<td>16,520</td>
</tr>
<tr>
<td>3</td>
<td>60,000</td>
<td>0.751</td>
<td>45,060</td>
</tr>
<tr>
<td>4</td>
<td>80,000</td>
<td>0.683</td>
<td>54,640</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$125,310</strong></td>
</tr>
</tbody>
</table>

Since the projects are mutually exclusive, the one with the higher net present value is the correct choice.

- Answer (B) is incorrect because Project Y has a lower net present value.
- Answer (C) is incorrect because The projects are mutually exclusive.
- Answer (D) is incorrect because Both projects have a positive net present value when discounted at the company’s required rate of return.
Brown and Company uses the internal rate of return (IRR) method to evaluate capital projects. Brown is considering four independent projects with the following IRRs:

<table>
<thead>
<tr>
<th>Project</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>10%</td>
</tr>
<tr>
<td>II</td>
<td>12%</td>
</tr>
<tr>
<td>III</td>
<td>14%</td>
</tr>
<tr>
<td>IV</td>
<td>15%</td>
</tr>
</tbody>
</table>

Brown’s cost of capital is 13%. Which one of the following project options should Brown accept based on IRR?

A. Projects I and II only.
B. Projects III and IV only.
C. Project IV only.
D. Projects I, II, III and IV.

• Answer (A) is incorrect because Projects I and II have rates of return lower than the company’s cost of capital.
• Answer (B) is correct. When sufficient funds are available, any capital project whose internal rate of return (IRR) exceeds the company’s cost of capital should be accepted.
• Answer (C) is incorrect because The rate of return for Project III also exceeds the company’s cost of capital.
• Answer (D) is incorrect because Projects I and II should be rejected; their rates of return are lower than the company’s cost of capital.

[Fact Pattern #156]

The following data pertain to a 4-year project being considered by Metro Industries:

- A depreciable asset that costs $1,200,000 will be acquired on January 1. The asset, which is expected to have a $200,000 salvage value at the end of 4 years, qualifies as 3-year property under the Modified Accelerated Cost Recovery System (MACRS).
- The new asset will replace an existing asset that has a tax basis of $150,000 and can be sold on the same January 1 for $180,000.
- The project is expected to provide added annual sales of 30,000 units at $20. Additional cash operating costs are: variable, $12 per unit; fixed, $90,000 per year.
- A $50,000 working capital investment that is fully recoverable at the end of the fourth year is required.

Metro is subject to a 40% income tax rate and rounds all computations to the nearest dollar. Assume that any gain or loss affects the taxes paid at the end of the year in which it occurred. The company uses the net present value method to analyze investments and will employ the following factors and rates.

<table>
<thead>
<tr>
<th>Period</th>
<th>Present Value of $1 at 12%</th>
<th>Present Value of $1 Annuity at 12%</th>
<th>MACRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.89</td>
<td>0.89</td>
<td>33%</td>
</tr>
<tr>
<td>2</td>
<td>0.80</td>
<td>1.69</td>
<td>45</td>
</tr>
<tr>
<td>3</td>
<td>0.71</td>
<td>2.40</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>0.64</td>
<td>3.04</td>
<td>7</td>
</tr>
</tbody>
</table>
The discounted cash flow for the fourth year MACRS depreciation on the new asset is

A. $0
B. $17,920
C. $21,504
D. $26,880

- Answer (A) is incorrect because A tax savings will result in the fourth year from the MACRS deduction.
- Answer (B) is incorrect because The amount of $17,920 is based on a depreciation calculation in which salvage value is subtracted from the initial cost.
- Answer (C) is correct. Tax law allows taxpayers to ignore salvage value when calculating depreciation under MACRS. Thus, the depreciation deduction is 7% of the initial $1,200,000 cost, or $84,000. At a 40% tax rate, the deduction will save the company $33,600 in taxes in the fourth year. The present value of this savings is $21,504 ($33,600 × 0.64 present value of $1 at 12% for four periods).
- Answer (D) is incorrect because The appropriate discount factor for the fourth period is 0.64, not 0.80.

The discounted, net-of-tax amount that relates to disposal of the existing asset is

A. $168,000
B. $169,320
C. $180,000
D. $190,680

- Answer (A) is incorrect because The amount of $168,000 fails to discount the outflow for taxes.
- Answer (B) is correct. The cash inflow from the existing asset is $180,000, but that amount is subject to tax on the $30,000 gain ($180,000 – $150,000 tax basis). The tax on the gain is $12,000 ($30,000 × 40%). Because the tax will not be paid until year end, the discounted value is $10,680 ($12,000 × .89 PV of $1 at 12% for one period). Thus, the net-of-tax inflow is $169,320 ($180,000 – $10,680). NOTE: This asset was probably a Section 1231 asset, and any gain on sale qualifies for the special capital gain tax rates. Had the problem not stipulated a 40% tax rate, the capital gains rate would be used. An answer based on that rate is not among the options.
- Answer (C) is incorrect because The amount of $180,000 ignores the impact of income taxes.
- Answer (D) is incorrect because The discounted present value of the income taxes is an outflow and is deducted from the inflow from the sale of the asset.

The expected incremental sales will provide a discounted, net-of-tax contribution margin over 4 years of

A. $57,600
B. $92,160
C. $273,600
D. $437,760

- Answer (A) is incorrect because The amount of $57,600 multiplies the annual increase in contribution margin by the tax rate instead of the PV factor.
- Answer (B) is incorrect because The amount of $92,160 is based on only 1 year’s results, not 4.
Answer (C) is incorrect because the amount of $273,600 improperly includes fixed costs in the calculation of the contribution margin.

Answer (D) is correct. Additional annual sales are 30,000 units at $20 per unit. If variable costs are expected to be $12 per unit, the unit contribution margin is $8, and the total before-tax annual contribution margin is $240,000 (30,000 units × $8). The after-tax total annual contribution margin is $144,000 [$240,000 × (1.0 – .4)]. This annual increase in the contribution margin should be treated as an annuity. Thus, its present value is $437,760 ($144,000 × 3.04 PV of an annuity of $1 at 12% for four periods).

The overall discounted-cash-flow impact of the working capital investment on Metro’s project is

A. $(2,800)
B. $(18,000)
C. $(50,000)
D. $(59,200)

Answer (A) is incorrect because the firm will have its working capital tied up for 4 years, which results in a cost of $18,000 at 12% interest.

Answer (B) is correct. The working capital investment is treated as a $50,000 outflow at the beginning of the project and a $50,000 inflow at the end of 4 years. Accordingly, the present value of the inflow after 4 years should be subtracted from the initial $50,000 outlay. The overall discounted-cash-flow impact of the working capital investment is $18,000 [$50,000 – ($50,000 × .64 PV of $1 at 12% for four periods)].

Answer (C) is incorrect because the working capital cost of the project is the difference between $50,000 and the present value of $50,000 in 4 years.

Answer (D) is incorrect because the answer cannot exceed $50,000, which is the amount of the cash outflow.

A company is considering two mutually exclusive projects with the following projected cash flows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Project A</th>
<th>Project B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(100,000)</td>
<td>$(100,000)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>34,320</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>34,320</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>34,320</td>
</tr>
<tr>
<td>4</td>
<td>$157,352</td>
<td>34,320</td>
</tr>
</tbody>
</table>

The company has a required rate of return of 8%. If the company’s objective is to maximize shareholder wealth, which one of the following is the most valid reason for selecting one of the projects.

A. The net present value of Project A is greater than the net present value of Project B, therefore select Project A.
B. The net present value of Project A is less than the net present value of Project B, therefore select Project B.
C. The internal rate of return of Project A is greater than the internal rate of return of Project B, therefore select Project A.
D. The internal rate of return of Project A is less than the internal rate of return of Project B, therefore select Project B.
Answer (A) is correct. Project A has a single cash inflow, calculated as the present value of a single payment in 4 years discounted at 8%:

<table>
<thead>
<tr>
<th>Net initial investment</th>
<th>$(100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present value of cash inflows ($157,352 x 0.735)</td>
<td>115,654</td>
</tr>
<tr>
<td>Net present value</td>
<td>$ 15,654</td>
</tr>
</tbody>
</table>

Project B has multiple even cash inflows, calculated as the present value of an ordinary annuity for 4 years discounted at 8%:

<table>
<thead>
<tr>
<th>Net initial investment</th>
<th>$(100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present value of cash inflows ($34,320 x 3.312)</td>
<td>113,668</td>
</tr>
<tr>
<td>Net present value</td>
<td>$ 13,668</td>
</tr>
</tbody>
</table>

The net present value of Project A is thus greater than that of Project B.

Answer (B) is incorrect because the net present value of Project A is thus greater than that of Project B.

Answer (C) is incorrect because when net present value can be reasonably determined, comparing internal rates of return is not the soundest means of determining the best capital project.

Answer (D) is incorrect because when net present value can be reasonably determined, comparing internal rates of return is not the soundest means of determining the best capital project.

Depreciation is incorporated explicitly in the discounted cash flow analysis of an investment proposal because it

A. Is a cost of operations that cannot be avoided.
B. Is a cash inflow.
C. Reduces the cash outlay for income taxes.
D. Represents the initial cash outflow spread over the life of the investment.

Answer (A) is incorrect because depreciation is not a cost of operations in the capital budgeting model. Also, depreciation can be avoided by not making investments.

Answer (B) is incorrect because depreciation is an allocation of historical cost and as such is not a cash inflow, but it may reduce cash outflows for taxes.

Answer (C) is correct. Depreciation is a noncash expense that is deductible for federal income tax purposes. Hence, it directly reduces the cash outlay for income taxes and is explicitly incorporated in the capital budgeting model.

Answer (D) is incorrect because periodic depreciation is determined by spreading the depreciation base, i.e., the cost of the asset minus salvage value, not the initial cash outflow, over the life of the investment.

The method that recognizes the time value of money by discounting the after-tax cash flows over the life of a project, using the company’s minimum desired rate of return is the

A. Accounting rate of return method.
B. Net present value method.
C. Internal rate of return method.
D. Payback method.

Answer (A) is incorrect because the accounting rate of return uses net income (not cash flows) to determine a rate of profitability.
Answer (B) is correct. The net present value (NPV) method computes the discounted present value of future cash inflows to determine whether they are greater than the initial cash outflow. The discount rate (cost of capital or hurdle rate) must be known to discount the future cash inflows. If the NPV is positive (present value of future cash inflows exceeds initial cash outflow), the project should be accepted. If the NPV is negative, the project should be rejected.

Answer (C) is incorrect because the internal rate of return is the rate at which NPV is zero. The minimum desired rate of return is not used.

Answer (D) is incorrect because the payback method measures the time required to complete the return of the original investment. It gives no consideration to the time value of money or to returns after the payback period.

A company has unlimited capital funds to invest. The decision rule for the company to follow in order to maximize shareholders’ wealth is to invest in all projects having a(n)

A. Present value greater than zero.
B. Net present value greater than zero.
C. Internal rate of return greater than zero.
D. Accounting rate of return greater than the hurdle rate used in capital budgeting analyses.

Answer (A) is incorrect because the present value of future net cash inflows must be compared with the initial cash outlay to determine whether a project is acceptable.

Answer (B) is correct. If the net present value (NPV) of an investment is positive, the project should be accepted (unless projects are mutually exclusive). If the NPV is negative, the investment should be rejected.

Answer (C) is incorrect because an IRR may be greater than zero but less than a firm’s cost of capital, in which case the project would not be profitable.

Answer (D) is incorrect because the accounting rate of return is not based on cash flows and is irrelevant to a company’s hurdle rate.

Future, Inc., is in the enviable situation of having unlimited capital funds. The best decision rule, in an economic sense, for it to follow would be to invest in all projects in which the

A. Accounting rate of return is greater than the earnings as a percent of sales.
B. Payback reciprocal is greater than the internal rate of return.
C. Internal rate of return is greater than zero.
D. Net present value is greater than zero.

Answer (A) is incorrect because neither the accounting rate of return nor the earnings as a percent of sales is useful in capital budgeting. The accounting rate of return is accounting net income over the required investment; it ignores the time value of money. Earnings as a percent of sales ignores the amount of required investment.

Answer (B) is incorrect because the payback criterion for capital budgeting is not efficient or effective.

Answer (C) is incorrect because the problem states that there are unlimited capital funds but does not indicate what the cost of capital is. Accordingly, projects can only be invested in when the internal rate of return is greater than cost of capital, i.e., the net present value is greater than zero.

Answer (D) is correct. Given unlimited funds, all projects with a net present value greater than zero should be invested in. Thus, it would be profitable to invest in any company where the rate of return is greater than the cost of capital.
The technique that recognizes the time value of money by discounting the after-tax cash flows for a project over its life to time period zero using the company’s minimum desired rate of return is called the

A. Net present value method.
B. Payback method.
C. Average rate of return method.
D. Accounting rate of return method.

- Answer (A) is correct. The net present value method discounts future cash flows to the present value using some arbitrary rate of return, which is presumably the firm’s cost of capital. The initial cost of the project is then deducted from the present value. If the present value of the future cash flows exceeds the cost, the investment is considered to be acceptable.
- Answer (B) is incorrect because The payback method does not recognize the time value of money.
- Answer (C) is incorrect because The average rate of return method does not use the firm’s cost of capital as a discount rate.
- Answer (D) is incorrect because The accounting rate of return method does not recognize the time value of money.

Mintz Corporation is considering the acquisition of a new technologically efficient packaging machine at a cost of $300,000. The equipment requires an immediate, fully recoverable investment in working capital of $40,000. Mintz plans to use the machine for 5 years, is subject to a 40% income tax rate, and uses a 12% hurdle rate when analyzing capital investments. The company employs the net present value method (NPV) to analyze projects.

The overall impact of the working capital investment on Mintz’s NPV analysis is

A. $(10,392)
B. $(13,040)
C. $(17,320)
D. $(40,000)

- Answer (A) is incorrect because The amount of $(10,392) results from improperly applying the effect of income taxes.
- Answer (B) is incorrect because The amount of $(13,040) assumes a tax on the present value of the recovery.
- Answer (C) is correct. The present value of the amount committed to working capital is its face amount ($40,000 \times 1.000 = $40,000). The present value of the recovery is calculated as follows:

<table>
<thead>
<tr>
<th>Amount to be recovered</th>
<th>$40,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times: PV factor for single amount in 5 years</td>
<td>$ \times \ 0.567$</td>
</tr>
<tr>
<td>Present value of recovery</td>
<td>$22,680$</td>
</tr>
</tbody>
</table>

The overall impact on Mintz’s working capital is therefore a decrease of $17,320 (22,680 – 40,000).
- Answer (D) is incorrect because The amount of $(40,000) results from failing to take the eventual recovery into account.
For each of the next 6 years, Atlantic Motors anticipates a net income of $10,000, a straight-line tax depreciation of $20,000, a 40% tax rate, a discount rate of 10%, and cash sales of $100,000. The depreciable assets are all being acquired at the beginning of Year 1 and will have a salvage value of zero at the end of 6 years. The present value of the total depreciation tax savings would be

A. $8,000
B. $27,072
C. $34,840
D. $87,100

- Answer (A) is incorrect because the amount of $8,000 is the depreciation tax shield for a single year, i.e., undiscounted.
- Answer (B) is incorrect because the amount of $27,072 reduced the factor as if it were an annuity due.
- Answer (C) is correct. The present value of Atlantic’s total depreciation tax savings can be calculated as follows:

  Annual tax depreciation $20,000
  Times: tax rate $40%
  Annual depreciation tax shield $8,000
  Times: PV factor for ordinary annuity $4.355
  PV of depreciation tax shield $34,840

- Answer (D) is incorrect because the amount of $87,100 results from failing to account for the effect of income taxes.

Webster Products is performing a capital budgeting analysis on a new product it is considering. Annual sales are expected to be 50,000 units in the first year, 100,000 units in the second year, and 125,000 units the year thereafter. Selling price will be $80 in the first year and is expected to decrease by 5% per year. Annual costs are forecasted as follows:

- Fixed costs $300,000 each year
- Labor cost per unit $20 in year 1, increasing 5% per year thereafter
- Material cost per unit $30 in year 1, increasing 10% per year thereafter

The investment of $2 million will be depreciated on a straight-line basis over 4 years for financial reporting and tax purposes. Webster’s effective tax rate is 40%. When calculating net present value (NPV), the net cash flow for Year 3 would be

A. $558,750
B. $858,750
C. $1,058,750
D. $1,070,000

- Answer (A) is incorrect because the amount of $558,750 results from subtracting depreciation expense rather than adding back the depreciation tax shield.
- Answer (B) is incorrect because the amount of $858,750 results from failing to add back the depreciation tax shield.
Answer (C) is correct. Webster’s net cash flows for this product can be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per-unit selling price</td>
<td>$ 80.00</td>
<td>$ 76.00</td>
<td>$ 72.20</td>
</tr>
<tr>
<td>Less: per-unit materials cost</td>
<td>(30.00)</td>
<td>(33.00)</td>
<td>(36.30)</td>
</tr>
<tr>
<td>Less: per-unit labor cost</td>
<td>(20.00)</td>
<td>(21.00)</td>
<td>(22.05)</td>
</tr>
<tr>
<td>Per-unit contribution margin</td>
<td>$ 30.00</td>
<td>$ 22.00</td>
<td>$ 13.85</td>
</tr>
<tr>
<td>Times: projected unit sales</td>
<td>× 50,000</td>
<td>× 100,000</td>
<td>× 125,000</td>
</tr>
<tr>
<td>Total contribution margin</td>
<td>$1,500,000</td>
<td>$2,200,000</td>
<td>$1,731,250</td>
</tr>
<tr>
<td>Less: fixed costs</td>
<td>(300,000)</td>
<td>(300,000)</td>
<td>(300,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td>$1,200,000</td>
<td>$1,900,000</td>
<td>$1,431,250</td>
</tr>
<tr>
<td>Less: income taxes (40%)</td>
<td>(480,000)</td>
<td>(760,000)</td>
<td>(572,500)</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 720,000</td>
<td>$1,140,000</td>
<td>$ 858,750</td>
</tr>
<tr>
<td>Add: depreciation tax shield</td>
<td>200,000</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Net cash flows</td>
<td>$ 920,000</td>
<td>$1,340,000</td>
<td>$1,058,750</td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because the amount of $1,070,000 results from deriving the Year 3 per-unit amounts by applying the adjustment percentages to the Year 1 amounts rather than to the Year 2 amounts.

Allstar Company invests in a project with expected cash inflows of $9,000 per year for 4 years. All cash flows occur at year end. The required return on investment is 9%. If the project generates a net present value (NPV) of $3,000, what is the amount of the initial investment in the project?

A. $11,25.
B. $13,236
C. $26,160
D. $29,160

Answer (A) is incorrect because the amount of $11,253 ignores the fact that $9,000 will be the inflow in each of the 4 years.

Answer (B) is incorrect because the amount of $13,236 ignores the fact that $9,000 will be the inflow in each of the 4 years.

Answer (C) is correct. Allstar’s initial investment in this project can be calculated as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual cash inflows</td>
<td>$ 9,000</td>
</tr>
<tr>
<td>Times: PV factor</td>
<td>× 3.240</td>
</tr>
<tr>
<td>PV of cash inflows</td>
<td>$29,160</td>
</tr>
<tr>
<td>Less: NPV of project</td>
<td>(3,000)</td>
</tr>
<tr>
<td>Amount invested</td>
<td>$26,160</td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because the amount of $29,160 is the present value of the cash inflows.
Topeka Products uses the net present value (NPV) method to evaluate capital projects. Topeka plans to acquire a depreciable asset on January 1 of next year for $2.4 million. The new asset has an estimated service life of 4 years, a zero terminal disposal value, and will be depreciated on a straight-line basis. The new asset will replace an existing asset that is expected to be sold for $350,000. The tax basis of the existing asset is $330,000. Topeka is subject to an effective income tax rate of 40% and assumes that any gains or losses affect the taxes paid at the end of the year in which the gains or losses occur. Topeka uses a 10% discount rate for NPV analyses.

The amount related to the new asset’s depreciation that would be included in an NPV analysis is

A. $760,800
B. $1,141,200
C. $1,639,200
D. $1,902,000

Answer (A) is correct. The relevant amount for depreciation used in Topeka’s NPV analysis can be calculated as follows:

\[
\begin{align*}
\text{Asset cost} & \quad \$2,400,000 \\
\text{Divided by: useful life} & \quad \div 4 \\
\text{Annual depreciation} & \quad $ 600,000 \\
\text{Times: tax rate} & \quad 0.40 \\
\text{Depreciation tax shield} & \quad $ 240,000 \\
\text{Times: PV factor} & \quad \times 3.170 \\
\text{PV of depreciation tax shield} & \quad $760,800
\end{align*}
\]

Answer (B) is incorrect because the amount of $1,141,200 results from reversing the percentage of the depreciation tax shield.

Answer (C) is incorrect because the amount of $1,639,200 is the present value of $2,400,000 discounted for 4 periods at 10%.

Answer (D) is incorrect because the amount of $1,902,000 results from failing to subtract the depreciation tax shield.

Sarah Birdsong has prepared a net present value (NPV) analysis for a 15-year equipment modernization program. Her initial calculations include a series of depreciation tax savings, which are then discounted. Birdsong is now considering the incorporation of inflation into the NPV analysis. If the depreciation tax savings were based on original equipment cost, which of the following options correctly shows how she should handle the program’s cash operating costs and the firm’s required rate of return, respectively?

<table>
<thead>
<tr>
<th>Cash Operating Costs</th>
<th>Required Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Adjust for inflation</td>
<td>Adjust for inflation</td>
</tr>
<tr>
<td>B. Adjust for inflation</td>
<td>Do not adjust for inflation</td>
</tr>
<tr>
<td>C. Do not adjust for inflation</td>
<td>Adjust for inflation</td>
</tr>
<tr>
<td>D. Do not adjust for inflation</td>
<td>Do not adjust for inflation</td>
</tr>
</tbody>
</table>

Answer (A) is correct. Inflation erodes the purchasing power of money over time. Therefore, both cash operating costs and the required rate of return must be adjusted for inflation.

Answer (B) is incorrect because Required rate of return must also be adjusted for inflation.

Answer (C) is incorrect because Cash operating costs must also be adjusted for inflation.

Answer (D) is incorrect because Both cash operating costs and the required rate of return must be adjusted for inflation.
If the present value of expected cash inflows from a project equals the present value of expected cash outflows, the discount rate is th.

A. Payback rate.
B. Internal rate of return.
C. Accounting rate of return.
D. Net present value rate.

- Answer (A) is incorrect because “Payback rate” is not a meaningful term in this context.
- Answer (B) is correct. The definition of the internal rate of return is the discount rate at which the net present value of a project’s cash flows equals zero.
- Answer (C) is incorrect because The accounting rate of return is arrived at without reference to present value.
- Answer (D) is incorrect because The net present value rate is the rate under discussion.

Nolan Hospital has decided to acquire diagnostic equipment from Weber Medical Products based on Weber’s reputation for quality. Weber has offered Nolan four payment options, as shown in the following table. All payments would be due and paid at the beginning of each year.

<table>
<thead>
<tr>
<th>Year</th>
<th>Options (dollars in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Nolan’s cost of funds is 8%. Which payment option should Nolan choose?

A. I
B. II
C. III
D. IV

- Answer (A) is incorrect because The present value of an annuity due of $5 million for 4 periods at 8% is $17,890,000 ($5,000,000 × 3.578).
- Answer (B) is incorrect because The present value of two payments of $10 million at 8% received 1 and 2 periods hence is $17,830,000 [(10,000,000 × 0.926) + (10,000,000 × 0.857)].
- Answer (C) is incorrect because The present value of $18 million paid today is $18 million.
- Answer (D) is correct. The present value of $22 million paid 3 periods hence discounted at 8% is $17,468,000 ($22,000,000 × 0.794), the most affordable of the four alternatives offered.
Stennet Company is considering two mutually exclusive projects. The net present value (NPV) profiles of the two projects are as follows:

<table>
<thead>
<tr>
<th>Discount Rate (percent)</th>
<th>Net Present Value $(000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project A</td>
</tr>
<tr>
<td>0</td>
<td>$2,220</td>
</tr>
<tr>
<td>10</td>
<td>681</td>
</tr>
<tr>
<td>12</td>
<td>495</td>
</tr>
<tr>
<td>14</td>
<td>335</td>
</tr>
<tr>
<td>16</td>
<td>197</td>
</tr>
<tr>
<td>18</td>
<td>77</td>
</tr>
<tr>
<td>20</td>
<td>(26)</td>
</tr>
<tr>
<td>22</td>
<td>(115)</td>
</tr>
<tr>
<td>24</td>
<td>(193)</td>
</tr>
<tr>
<td>26</td>
<td>(260)</td>
</tr>
<tr>
<td>28</td>
<td>(318)</td>
</tr>
</tbody>
</table>

The approximate internal rates of return for Projects A and B, respectively, are

A. 0% and 0%.
B. 19.0% and 21.5%.
C. 19.5% and 25.5%.
D. 20.5% and 26.5%.

- Answer (A) is incorrect because Zero is the net present value, not the discount rate, associated with the internal rate of return.
- Answer (B) is incorrect because The internal rate of return for Project B is between 24% and 26%.
- Answer (C) is correct. A project’s internal rate of return is the discount rate at which the net present value of its cash flows equals zero. For Project A, this is somewhere between 18% and 20%, and for Project B, it is between 24% and 26%.
- Answer (D) is incorrect because The internal rate of return of Project A is less than 20% and that for Project B is less than 26%.

The company president is of the view that Project B should be accepted because it has the higher internal rate of return (IRR). The president requested John Mack, the CFO, to make a recommendation. The company’s cost of capital is 10%. Which one of the following options should Mack recommend to the president.

A. Agree with the president.
B. Accept Project A because it has an IRR higher than that of Project B.
C. Accept both Projects A and B, as the IRR for each project is greater than cost of capital.
D. Accept Project A because at a 10% discount rate, it has an NPV that is greater than that of Project B.

- Answer (A) is incorrect because The CFO has a fiduciary duty to not merely agree with the president.
- Answer (B) is incorrect because IRR is not the most effective guide to capital project profitability in all cases because it assumes that early returns can be reinvested at the IRR, which may not always be true.
Answer (C) is incorrect because The projects are mutually exclusive. Answer (D) is correct. Net present value (NPV) is the most satisfactory method of evaluating competing capital projects. At a hurdle rate of 10%, Project A has the higher NPV and is therefore the more desirable project.

Bell Delivery Co. is financing a new truck with a loan of $30,000 to be repaid in five annual installments of $7,900 at the end of each year. What is the approximate annual interest rate Bell is paying?

A. 4%  
B. 5%  
C. 10%  
D. 16%

Answer (A) is incorrect because The discount rate represented by an ordinary annuity of $7,900 for 5 years is closer to 10%. Answer (B) is incorrect because The discount rate represented by an ordinary annuity of $7,900 for 5 years is closer to 10%. Answer (C) is correct. Dividing the loan value by the periodic payments produces a present value factor of 3.797 ($30,000 ÷ $7,900). Consulting the row for 5 years on the present value table for an ordinary annuity reveals the closest amount to this value in the 10% column. Answer (D) is incorrect because The discount rate represented by an ordinary annuity of $7,900 for 5 years is closer to 10%.

All of the following are methods used to evaluate investments for capital budgeting decisions except

A. Accounting rate of return.  
B. Internal rate of return  
C. Excess present value (profitability) index.  
D. Required rate of return.

Answer (A) is incorrect because The accounting rate of return, also called the book rate of return, is a method used to evaluate capital projects. Answer (B) is incorrect because The internal rate of return is a method used to evaluate capital projects. Answer (C) is incorrect because The excess present value (profitability) index is a method used to evaluate capital projects. Answer (D) is correct. The required rate of return, or hurdle rate, is the baseline rate against which potential capital projects are judged. Thus, it cannot be used to judge the worth of individual projects.

For a given investment project, the interest rate at which the present value of the cash inflows equals the present value of the cash outflows is called the

A. Hurdle rate.  
B. Payback rate.  
C. Internal rate of return.  
D. Cost of capital.

Answer (A) is incorrect because The hurdle rate is a firm’s minimum acceptable rate of return for a capital project. Answer (B) is incorrect because Payback rate is not a meaningful term in this context.
Answer (C) is correct. A capital project’s internal rate of return is the discount rate at which the net present value of the project’s cash flows equals zero, i.e., the rate at which discounted cash inflows equal discounted cash outflows.

Answer (D) is incorrect because The cost of capital is generally the same as the hurdle rate.

The net present value of an investment project represents the

A. Total actual cash inflows minus the total actual cash outflows.
B. Excess of the discounted cash inflows over the discounted cash outflows.
C. Total after-tax cash flow including the tax shield from depreciation.
D. Cumulative accounting profit over the life of the project.

- Answer (A) is incorrect because Actual cash inflows minus actual cash outflows ignores the time value of money.
- Answer (B) is correct. The net present value of an investment project represents the excess of the discounted cash inflows over the discounted cash outflows.
- Answer (C) is incorrect because Total after-tax cash flow, including the tax shield from depreciation, ignores the time value of money.
- Answer (D) is incorrect because Accounting profit ignores the time value of money.

Kunkle Products is analyzing whether to invest in equipment to manufacture a new product. The equipment will cost $1 million, is expected to last 10 years, and will be depreciated on a straight-line basis for both financial reporting and tax purposes. Kunkle’s effective tax rate is 40%, and its hurdle rate is 14%. Other information concerning the project is as follows:

Sales per year = 10,000 units
Selling price = $100 per unit
Variable cost = $70 per unit

A 10% reduction in variable costs would result in the net present value increasing by approximately:

A. $156,000
B. $219,000
C. $365,000
D. $367,000

- Answer (A) is incorrect because The amount of $156,000 uses the inverse of the tax rate to calculate taxes.
Answer (B) is correct. Equipment costing $1 million depreciated on a straight-line basis over 10 years will generate $100,000 of depreciation expense and a $40,000 depreciation tax shield ($100,000 × .40 tax rate) per year. Kunkle’s net cash flows under the two scenarios can therefore be calculated as follows:

<table>
<thead>
<tr>
<th>Reduction in Variable Costs</th>
<th>Original Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per-unit selling price</td>
<td>$100.00</td>
</tr>
<tr>
<td>Less: per-unit variable cost</td>
<td>(70.00)</td>
</tr>
<tr>
<td>Per-unit contribution margin</td>
<td>$30.00</td>
</tr>
<tr>
<td>Times: projected unit sales</td>
<td>× 10,000</td>
</tr>
<tr>
<td>Total contribution margin</td>
<td>$300,000</td>
</tr>
<tr>
<td>Less: fixed costs</td>
<td>(100,000)</td>
</tr>
<tr>
<td>Operating income</td>
<td>$200,000</td>
</tr>
<tr>
<td>Less: income taxes (40%)</td>
<td>(80,000)</td>
</tr>
<tr>
<td>Net income</td>
<td>$120,000</td>
</tr>
<tr>
<td>Add: depreciation tax shield</td>
<td>40,000</td>
</tr>
<tr>
<td>Net cash flows</td>
<td>$160,000</td>
</tr>
</tbody>
</table>

The difference in net cash flows under the two scenarios is $42,000 ($202,000 – $160,000). Discounted as an ordinary annuity for 10 years at 14%, the present value of this difference is $219,072 ($42,000 × 5.216).

- Answer (C) is incorrect because the amount of $365,000 ignores the tax on the additional income.
- Answer (D) is incorrect because the amount of $367,000 ignores the tax on the additional income.

Wilcox Corporation won a settlement in a lawsuit and was offered four different payment alternatives by the defendant’s insurance company. A review of interest rates indicates that 8% is appropriate for analyzing this situation. Ignoring any tax considerations, which one of the following four alternatives should the controller recommend to Wilcox management.

- A. $135,000 now.
- B. $40,000 per year at the end of each of the next 4 years.
- C. $5,000 now and $20,000 per year at the end of each of the next 10 years.
- D. $5,000 now and $5,000 per year at the end of each of the next 9 years, plus a lump-sum payment of $200,000 at the end of the tenth year.

- Answer (A) is incorrect because the amount of $135,000 is not the best alternative at a discount rate of 8%.
- Answer (B) is incorrect because the present value of an ordinary annuity of $40,000 at 8% for 5 years is only $132,400.
- Answer (C) is correct. The present value of $5,000 received today is $5,000 (using any discount rate). The present value of an ordinary annuity of $20,000 at 8% for 10 years is $134,200. The total present value of these two cash flows is therefore $139,200, the highest of any of the four offered.
- Answer (D) is incorrect because the present value of the cash flows described is only $128,850 ($5,000 + $31,250 + $92,600).
Smithco is considering the acquisition of scanning equipment to mechanize its procurement process. The equipment will require extensive testing and debugging, as well as user training, prior to its operational use. Projected after-tax cash flows are shown below.

<table>
<thead>
<tr>
<th>Year</th>
<th>After-Tax Cash Inflow/(Outflow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(550,000)</td>
</tr>
<tr>
<td>1</td>
<td>$(500,000)</td>
</tr>
<tr>
<td>2</td>
<td>450,000</td>
</tr>
<tr>
<td>3</td>
<td>350,000</td>
</tr>
<tr>
<td>4</td>
<td>350,000</td>
</tr>
<tr>
<td>5</td>
<td>350,000</td>
</tr>
</tbody>
</table>

Management anticipates the equipment will be sold at the beginning of Year 6 for $50,000 when its book value is zero. Smithco’s internal hurdle and effective tax rates are 14% and 40%, respectively.

Smithco’s net present value for the project would be

A. $(1,780)
B. $(6,970)
C. $(17,350)
D. $8,600

- Answer (A) is correct. The net present value for this project can be calculated as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>After-Tax Cash Inflow/(Outflow)</th>
<th>PV Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(550,000)</td>
<td>1.000</td>
<td>$(550,000)</td>
</tr>
<tr>
<td>1</td>
<td>$(500,000)</td>
<td>.877</td>
<td>(438,500)</td>
</tr>
<tr>
<td>2</td>
<td>450,000</td>
<td>.769</td>
<td>346,050</td>
</tr>
<tr>
<td>3</td>
<td>350,000</td>
<td>.675</td>
<td>236,250</td>
</tr>
<tr>
<td>4</td>
<td>350,000</td>
<td>.592</td>
<td>207,200</td>
</tr>
<tr>
<td>5</td>
<td>350,000</td>
<td>.519</td>
<td>181,650</td>
</tr>
<tr>
<td>6</td>
<td>30,000</td>
<td>.519</td>
<td>15,570</td>
</tr>
</tbody>
</table>

Net present value $ (1,780)

Note that the after-tax disposal proceeds [$50,000 \times (1.0 - .40)] are discounted at the 5-year factor because it occurs at the start of Year 6.

- Answer (B) is incorrect because the amount of $(6,970) uses the wrong factor to discount the proceeds from disposal.
- Answer (C) is incorrect because the amount of $(17,350) fails to consider the proceeds from disposal.
- Answer (D) is incorrect because the amount of $8,600 fails to include the tax on the disposal of the equipment, which is expected to be sold at greater than its book value.
Smithco’s payback period for the project will be

A. 2.3 years.
B. 3.0 years.
C. 3.5 years.
D. 3.75 years.

- Answer (A) is incorrect because the period of 2.3 years fails to consider the outflow in Year 1.
- Answer (B) is incorrect because the period of 3.0 years fails to consider the outflow in Year 1.
- Answer (C) is incorrect because the period of 3.5 years fails to consider the outflow in Year 1.
- Answer (D) is correct. Payback is the measure of the period it takes to recover the initial investment in a project. It will take almost 4 years to recover the initial investment of $550,000. Because of the outflow of $500,000 during the first year, the company will be trying to recover $1,050,000 by the end of Year 1. After recovering $450,000 in Year 2 and $350,000 in Year 3, the company will still need to recover an additional $250,000 ($1,050,000 – 450,000 – 350,000) in Year 4. Thus, it will take about 5/7 ($250,000/$350,000) of Year 4 to recover the initial investment.

Verla Industries is trying to decide which one of the following two options to pursue. Either option will take effect on January 1 of the next year.

**Option One - Acquire a New Finishing Machine.**

The cost of the machine is $1,000,000, and it will have a useful life of 5 years. Net pre-tax cash flows arising from savings in labor costs will amount to $100,000 per year for 5 years. Depreciation expense will be calculated using the straight-line method for both financial and tax reporting purposes. As an incentive to purchase, Verla will receive a trade-in allowance of $50,000 on their current fully depreciated finishing machine.

**Option Two - Outsource the Finishing Work.**

Verla can outsource the work to LM, Inc., at a cost of $200,000 per year for 5 years. If they outsource, Verla will scrap their current fully depreciated finishing machine.

Verla’s effective income tax rate is 40%. The weighted-average cost of capital is 10%.

Verla’s net present value of outsourcing the finishing work is

A. $303,280 net cash outflow.
B. $404,920 net cash outflow.
C. $454,920 net cash outflow.
D. $758,200 net cash outflow.

- Answer (A) is incorrect because the amount of $303,280 results from multiplying by the tax rate rather than by (1 – tax rate).
- Answer (B) is incorrect because the amount of $404,920 results from improperly subtracting the trade-in allowance, which applies only to Option 1.
Answer (C) is correct. Verla’s net present value of outsourcing the finishing work can be calculated as follows:

<table>
<thead>
<tr>
<th>Annual cost</th>
<th>$200,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times: tax effect</td>
<td>× 60%</td>
</tr>
<tr>
<td>After-tax cost</td>
<td>$120,000</td>
</tr>
<tr>
<td>Times: PV factor (10%)</td>
<td>× 3.791</td>
</tr>
<tr>
<td>Present value</td>
<td>$454,920</td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because the amount of $758,200 results from using the before-tax, rather than the after-tax, cash flow.

Verla Industries is trying to decide which one of the following two options to pursue. Either option will take effect on January 1st of the next year.

**Option One** - Acquire a New Finishing Machine.

The cost of the machine is $1,000,000, and it will have a useful life of 5 years. Net pre-tax cash flows arising from savings in labor costs will amount to $100,000 per year for 5 years. Depreciation expense will be calculated using the straight-line method for both financial and tax reporting purposes. As an incentive to purchase, Verla will receive a trade-in allowance of $50,000 on their current fully depreciated finishing machine.

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Verla can outsource the work to LM, Inc., at a cost of $200,000 per year for 5 years. If they outsource, Verla will scrap their current fully depreciated finishing machine.

Verla’s effective income tax rate is 40%. The weighted-average cost of capital is 10%.

Verla’s net present value of acquiring the new finishing machine is

A. $229,710 net cash outflow.
B. $267,620 net cash outflow.
C. $369,260 net cash outflow.
D. $434,424 net cash outflow.

- Answer (A) is incorrect because the amount of $229,710 ignores income taxes.
- Answer (B) is incorrect because the amount of $267,620 ignores the depreciation shield.
- Answer (C) is incorrect because the amount of $369,260 ignores the tax benefit on the annual labor savings.
- Answer (D) is correct. Verla’s net present value of acquiring the new finishing machine can be calculated as follows: With the trade-in allowance, the net cost will be $950,000. This will be depreciated over 5 years at $190,000 per year. The cash inflows consist of the $100,000 of annual cost savings, which reduces to $60,000 once taxes have been considered. Also, there will be an inflow from the depreciation shield ($190,000 × 40% tax rate, or an inflow of $76,000 per year). Combining the $60,000 after-tax savings from operations with the $76,000 of tax savings from depreciation produces a total of $136,000 of after-tax inflows annually. Discounting the five payments with the annuity factor of 3.791 (5 years at 10%) produces a present value of $515,576 ($136,000 × 3.791). Subtracting the present value of the inflows from the $950,000 initial outlay results in a net outflow of $434,424.
Jenson Copying Company is planning to buy a copying machine costing $25,310. The net present values (NPV) of this investment, at various discount rates, are as follows:

<table>
<thead>
<tr>
<th>Discount Rate</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>4%</td>
<td>$2,440</td>
</tr>
<tr>
<td>6%</td>
<td>1,420</td>
</tr>
<tr>
<td>8%</td>
<td>460</td>
</tr>
<tr>
<td>10%</td>
<td>(440)</td>
</tr>
</tbody>
</table>

Jenson’s approximate internal rate of return on this investment is

A. 6%
B. 8%
C. 9%
D. 10%

- Answer (A) is incorrect because at a discount rate of 6%, the net cash flows for this copying machine are positive.
- Answer (B) is incorrect because at a discount rate of 8%, the net cash flows for this copying machine are positive.
- Answer (C) is correct. A capital project’s internal rate of return is the discount rate at which the net present value of the project’s cash flows equals zero, i.e., the rate at which discounted cash inflows equal discounted cash outflows. For this copying machine, that rate is between 8%, at which net cash flows are positive, and 10%, at which net cash flows are negative.
- Answer (D) is incorrect because at a discount rate of 10%, the net cash flows for this copying machine are negative.

Long, Inc., is analyzing a $1 million investment in new equipment to produce a product with a $5 per-unit margin. The equipment will last 5 years, be depreciated on a straight-line basis for tax purposes, and have no value at the end of its life. A study of unit sales produced the following data:

<table>
<thead>
<tr>
<th>Annual Unit Sales</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>80,000</td>
<td>.10</td>
</tr>
<tr>
<td>85,000</td>
<td>.20</td>
</tr>
<tr>
<td>90,000</td>
<td>.30</td>
</tr>
<tr>
<td>95,000</td>
<td>.20</td>
</tr>
<tr>
<td>100,000</td>
<td>.10</td>
</tr>
<tr>
<td>110,000</td>
<td>.10</td>
</tr>
</tbody>
</table>

If Long utilizes a 12% hurdle rate and is subject to a 40% effective income tax rate, the expected net present value of the project would be

A. $261,750
B. $283,380
C. $297,800
D. $427,580

- Answer (A) is incorrect because the amount of $261,750 results from using the unit sales with the highest probability rather than the weighted average of all the unit sales.
Answer (B) is correct. Long’s most probable level of annual unit sales is calculated as follows:

<table>
<thead>
<tr>
<th>Annual Unit Sales</th>
<th>Probability</th>
<th>Probable Unit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>80,000</td>
<td>× 10%</td>
<td>8,000</td>
</tr>
<tr>
<td>85,000</td>
<td>× 20%</td>
<td>17,000</td>
</tr>
<tr>
<td>90,000</td>
<td>× 30%</td>
<td>27,000</td>
</tr>
<tr>
<td>95,000</td>
<td>× 20%</td>
<td>19,000</td>
</tr>
<tr>
<td>100,000</td>
<td>× 10%</td>
<td>10,000</td>
</tr>
<tr>
<td>110,000</td>
<td>× 10%</td>
<td>11,000</td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td>92,000</td>
</tr>
</tbody>
</table>

The expected annual inflow from sales is $460,000 (92,000 units × $5 margin each). The equipment will generate an annual depreciation tax shield of $80,000 ([($1,000,000 ÷ 5 years) × .40 tax rate]. The net present value of the project is calculated as follows:

Annual cash inflow $460,000  
Less: income taxes (40%)  (184,000)  
Net income $276,000  
Add: depreciation tax shield $80,000  
Net cash inflows $356,000  
Times: PV factor × 3.605  
PV of cash inflows $1,283,380  
Less: initial investment (1,000,000)  
NPV of project $283,380

Answer (C) is incorrect because the amount of $297,800 results from using a simple average of unit sales rather than a weighted average.

Answer (D) is incorrect because the amount of $427,580 results from reversing the percentage in calculating the depreciation tax shield.

Fred Kratz just completed a capital investment analysis for the acquisition of new material handling equipment. The equipment is expected to cost $1,000,000 and be used for 8 years. Kratz reviewed the net present value (NPV) analysis with Bill Dolan, Vice President of Finance. The analysis shows that the tax shield for this investment has a positive NPV of $200,000, using the firm’s hurdle rate of 20%. Dolan noticed that 8-year straight-line depreciation was used for tax purposes, but since this equipment qualifies for 3-year MACRS treatment, the tax shield analysis should be revised. The company has an effective tax rate of 40%. The MACRS rates for 3-year property are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33.33%</td>
</tr>
<tr>
<td>2</td>
<td>44.45%</td>
</tr>
<tr>
<td>3</td>
<td>14.81%</td>
</tr>
<tr>
<td>4</td>
<td>7.41%</td>
</tr>
</tbody>
</table>

Accordingly, the revised NPV for the tax shield (rounded to the nearest thousand) should be:

A. $109,000  
B. $192,000  
C. $283,000  
D. $425,000
Answer (A) is incorrect because the amount of $109,000 uses the wrong factors.
Answer (B) is incorrect because the amount of $192,000 uses the wrong factors.
Answer (C) is correct. The tax shield provided by using MACRS depreciation is derived as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of new equipment</th>
<th>Times: MACRS percentage</th>
<th>Depreciation expense</th>
<th>Times: PV factor (20%)</th>
<th>Present value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1,000,000</td>
<td>× 33.33%</td>
<td>$333,300</td>
<td>× 0.833</td>
<td>$277,639</td>
</tr>
<tr>
<td>2</td>
<td>$1,000,000</td>
<td>× 44.45%</td>
<td>$444,500</td>
<td>× 0.694</td>
<td>$308,483</td>
</tr>
<tr>
<td>3</td>
<td>$1,000,000</td>
<td>× 14.81%</td>
<td>$148,100</td>
<td>× 0.579</td>
<td>$85,750</td>
</tr>
<tr>
<td>4</td>
<td>$1,000,000</td>
<td>× 7.41%</td>
<td>$74,100</td>
<td>× 0.482</td>
<td>$35,716</td>
</tr>
</tbody>
</table>

The total of these outflows is $707,588, and the resulting depreciation tax shield is $283,035 ($707,588 × 0.40 tax rate).
Answer (D) is incorrect because the amount of $425,000 uses the wrong factors.

---

[Fact Pattern #159]
Foster Manufacturing is analyzing a capital investment project that is forecasted to produce the following cash flows and net income:

<table>
<thead>
<tr>
<th>Year</th>
<th>After-Tax Cash Flows</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(20,000)</td>
<td>$0</td>
</tr>
<tr>
<td>1</td>
<td>6,000</td>
<td>2,000</td>
</tr>
<tr>
<td>2</td>
<td>6,000</td>
<td>2,000</td>
</tr>
<tr>
<td>3</td>
<td>8,000</td>
<td>2,000</td>
</tr>
<tr>
<td>4</td>
<td>8,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Foster’s cost of capital is 12%.

[1503](Refers to Fact Pattern #159)
Foster’s net present value for this project is

A. $(1,600).
B. $924
C. $6,07.
D. $6,998

Answer (A) is incorrect because the amount of $(1,600) is not a meaningful amount.
Answer (B) is correct. The net present value of this project at 12% can be calculated as follows:

<table>
<thead>
<tr>
<th>After-Tax Cash Flows</th>
<th>PV Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment $(20,000)</td>
<td>1.000</td>
<td>$(20,000)</td>
</tr>
<tr>
<td>Year 1 6,000</td>
<td>0.893</td>
<td>5,358</td>
</tr>
<tr>
<td>Year 2 6,000</td>
<td>0.797</td>
<td>4,782</td>
</tr>
<tr>
<td>Year 3 8,000</td>
<td>0.712</td>
<td>5,696</td>
</tr>
<tr>
<td>Year 4 8,000</td>
<td>0.636</td>
<td>5,088</td>
</tr>
</tbody>
</table>

$924

Answer (C) is incorrect because the present value of the net incomes is $6,074, which is not a meaningful amount.

Answer (D) is incorrect because the amount of $6,998 results from discounting the sums of the after-tax cash flows and net income amounts.

Foster’s internal rate of return (rounded to the nearest whole percentage) is:

A. 5
B. 12%
C. 14%
D. 40

Answer (A) is incorrect because the internal rate of return for this project is closest to 14%.

Answer (B) is incorrect because the internal rate of return for this project is closest to 14%. 
Answer (C) is correct. A capital project’s internal rate of return is the discount rate at which the net present value of the project’s cash flows equals zero, i.e., the rate at which discounted cash inflows equal discounted cash outflows. The net present value of this project at 12% can be calculated as follows:

<table>
<thead>
<tr>
<th>After-Tax PV Cash Flows</th>
<th>PV Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(20,000)</td>
<td>$(20,000)</td>
</tr>
<tr>
<td>Year 1</td>
<td>6,000</td>
<td>5,358</td>
</tr>
<tr>
<td>Year 2</td>
<td>6,000</td>
<td>4,782</td>
</tr>
<tr>
<td>Year 3</td>
<td>8,000</td>
<td>5,696</td>
</tr>
<tr>
<td>Year 4</td>
<td>8,000</td>
<td>5,088</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ 924</td>
</tr>
</tbody>
</table>

Thus, the answer must be greater than 12%. This problem is solved on basically a trial-and-error basis. At 14%, the net present value can be calculated as follows:

<table>
<thead>
<tr>
<th>After-Tax PV Cash Flows</th>
<th>PV Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(20,000)</td>
<td>$(20,000)</td>
</tr>
<tr>
<td>Year 1</td>
<td>6,000</td>
<td>5,262</td>
</tr>
<tr>
<td>Year 2</td>
<td>6,000</td>
<td>4,614</td>
</tr>
<tr>
<td>Year 3</td>
<td>8,000</td>
<td>5,400</td>
</tr>
<tr>
<td>Year 4</td>
<td>8,000</td>
<td>4,736</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$ 12</td>
</tr>
</tbody>
</table>

The internal rate of return is thus slightly over 14%.

Answer (D) is incorrect because The internal rate of return for this project is closest to 14%.

[1505]Lunar, Inc., is considering the purchase of a machine for $500,000 that will last 5 years. A financial analysis is being developed using the following information:

<table>
<thead>
<tr>
<th>Unit sales</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10,000</td>
<td>10,000</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Selling price per unit</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
<td>$100</td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>300,000</td>
<td>300,000</td>
<td>300,000</td>
<td>300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Pre-tax cash flow</td>
<td>50,000</td>
<td>50,000</td>
<td>400,000</td>
<td>400,000</td>
<td>400,000</td>
</tr>
</tbody>
</table>

The machine will be depreciated over 5 years on a straight-line basis for tax purposes, and Lunar is subject to a 40% effective income tax rate. Assuming Lunar will have significant taxable income from other lines of business, and using a 20% discount rate, the net present value of the project will be:

A. $(282,470)
B. $(103,070)
C. $(14,010)
D. $16,530

Answer (A) is incorrect because The amount of $(282,470) results from reversing the sign of the depreciation tax shield.
Answer (B) is incorrect because The amount of $(103,070) results from failing to account for the depreciation tax shield.
Answer (C) is incorrect because The amount of $(14,010) understates the benefits of the depreciation shield.
Answer (D) is correct. To derive the present value of the cash inflows, the present value factors must be applied to the after-tax cash flows, derived by multiplying each pre-tax flow by \((1 - \text{tax rate})\). The respective cash inflows after taxes are thus $30,000, $30,000, $240,000, $240,000, and $240,000. The present value of this stream discounted at 20% is calculated as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>After-Tax Cash Flows</th>
<th>PV Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$30,000</td>
<td>0.833</td>
<td>$24,990</td>
</tr>
<tr>
<td>2</td>
<td>30,000</td>
<td>0.694</td>
<td>20,820</td>
</tr>
<tr>
<td>3</td>
<td>240,000</td>
<td>0.579</td>
<td>138,960</td>
</tr>
<tr>
<td>4</td>
<td>240,000</td>
<td>0.482</td>
<td>115,680</td>
</tr>
<tr>
<td>5</td>
<td>240,000</td>
<td>0.402</td>
<td>96,480</td>
</tr>
</tbody>
</table>

$396,930

The present value of the annual depreciation tax shield on the new equipment can be added to that of the after-tax cash inflows. The tax shield constitutes an ordinary annuity and is derived as follows:

- Cost of new equipment: $500,000
- Divided by: estimated useful life ÷ 5
- Annual depreciation expense: $100,000
- Times: tax rate × 40%
- Annual depreciation tax shield: $40,000
- Times: PV factor × 2.99
- PV of depreciation tax shield: $119,600

The total discounted cash inflows are therefore $516,530 ($396,930 + $119,600). Subtracting the $500,000 cost of the new machine leaves a net present value for this project of $16,530.

Foster Manufacturing is analyzing a capital investment project that is forecasted to produce the following cash flows and net income:

<table>
<thead>
<tr>
<th>Year</th>
<th>After-Tax Cash flow</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>($20,000)</td>
<td>$0</td>
</tr>
<tr>
<td>1</td>
<td>6,000</td>
<td>2,000</td>
</tr>
<tr>
<td>2</td>
<td>6,000</td>
<td>2,000</td>
</tr>
<tr>
<td>3</td>
<td>8,000</td>
<td>2,000</td>
</tr>
<tr>
<td>4</td>
<td>8,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Foster’s payback period for this project will be:

- A. 2.5 years.
- B. 2.6 years.
- C. 3.0 years.
- D. 3.3 years.

Answer (A) is incorrect because the period of 2.5 years results from using an $8,000 cash flow for all years.
Answer (B) is incorrect because the period of 2.6 years results from using a single inflow of $6,000, a single inflow of $8,000, and a single inflow of $10,000.
Answer (C) is correct. The payback period for this project can be calculated as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>After-Tax Remaining Cash Flows</th>
<th>Remaining Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$ --</td>
<td>$20,000</td>
</tr>
<tr>
<td>1</td>
<td>6,000</td>
<td>14,000</td>
</tr>
<tr>
<td>2</td>
<td>6,000</td>
<td>8,000</td>
</tr>
<tr>
<td>3</td>
<td>8,000</td>
<td>0</td>
</tr>
</tbody>
</table>

Answer (D) is incorrect because the period of 3.3 years results from using a $6,000 cash flow for all years.

An investment decision is acceptable if the net present value is greater than or equal to $0. A. Net present value is greater than or equal to $0. B. Present value of cash inflows is less than the present value of cash outflows. C. Present value of cash outflows is greater than or equal to $0. D. Present value of cash inflows is greater than or equal to $0.

Answer (A) is correct. The net present value of a capital project is the sum of the present values of all the cash inflows associated with the project netted against the sum of the present values of all the cash outflows. If the present value of the inflows exceeds the present value of the outflows, the project is profitable.

Answer (B) is incorrect because an investment decision is acceptable only if the present value of cash inflows exceeds the present value of cash outflows.

Answer (C) is incorrect because the cash outflows considered in isolation cannot reveal whether an investment decision is sound.

Answer (D) is incorrect because the cash inflows considered in isolation cannot reveal whether an investment decision is sound.

Logan Enterprises is at a critical decision point and must decide whether to go out of business or continue to operate for 5 more years. Logan has a labor contract with 5 years remaining that calls for $1.5 million in severance pay if Logan’s plant shuts down. The firm also has a contract to supply 150,000 units per year, at a price of $100 each, to Dill, Inc., for the next 5 years. Dill is Logan’s only remaining customer. Logan must pay Dill $500,000 immediately if it defaults on the contract. The plant has a net book value of $600,000, and appraisers estimate the facility would sell for $750,000 today but would have no market value if operated for another 5 years. Logan’s fixed costs are $4 million per year, and variable costs are $75 per unit. Logan’s appropriate discount rate is 12%. Ignoring taxes, the optimal decision is:

A. Shut down because the annual cash flow is negative $250,000 per year. B. Keep operating to avoid the severance pay of $1,500,000. C. Shut down since the breakeven point is 160,000 units, while annual sales are 150,000 units. D. Keep operating since the incremental net present value is approximately $350,000.

Answer (A) is incorrect because the annual negative cash flow must be discounted to be meaningful.

Answer (B) is incorrect because the severance pay is only one of several relevant costs and revenues in the decision.

Answer (C) is incorrect because breakeven analysis is not the appropriate tool in a shutdown decision.
Answer (D) is correct. If Logan makes the decision to cease operations, the firm will incur an immediate cash outflow calculated as follows:

**Shutdown:**
- Severance pay: $(1,500,000)
- Contract breach penalty: $(500,000)
- Plant disposal: $750,000

**Net cash flow:** $(1,250,000)

If the decision is made to keep operating, the annual cash inflows from product sales will be $3,750,000 [150,000 units × ($100 – $75)]. These inflows are netted against the annual outflows for fixed costs, and the result is discounted as an ordinary annuity at 12% for 5 years as follows:

**Continue:**
- Contract profit: $3,750,000
- Fixed costs: $(4,000,000)

**Annual cash flows:** $(250,000)

**Times: PV factor:** 3.605

**Present value:** $(901,250)

The firm will thus incur a smaller net loss by continuing operations [$1,250,000 – $901,250 = $348,750].

Parker Industries is analyzing a $200,000 equipment investment to produce a new product for the next 5 years. A study of expected annual after-tax cash flows from the project produced the following data:

<table>
<thead>
<tr>
<th>Annual After-Tax Cash Flow</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$45,000</td>
<td>.10</td>
</tr>
<tr>
<td>50,000</td>
<td>.20</td>
</tr>
<tr>
<td>55,000</td>
<td>.30</td>
</tr>
<tr>
<td>60,000</td>
<td>.20</td>
</tr>
<tr>
<td>65,000</td>
<td>.10</td>
</tr>
<tr>
<td>70,000</td>
<td>.10</td>
</tr>
</tbody>
</table>

If Parker utilizes a 14% hurdle rate, the probability of achieving a positive net present value is:

- A. 20%
- B. 30%
- C. 40%
- D. 60%

- **Answer (A) is incorrect because** This percentage results from only including the two highest annual cash flows.
- **Answer (B) is incorrect because** This percentage results from excluding the highest annual cash flow.
Answer (C) is correct. The projected after-tax cash flows can be discounted as ordinary annuities at 14% for 5 years as follows:

<table>
<thead>
<tr>
<th>Cash Flow</th>
<th>After-Tax PV Present Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>$45,000</td>
<td>$154,485</td>
<td>10%</td>
</tr>
<tr>
<td>50,000</td>
<td>171,650</td>
<td>20%</td>
</tr>
<tr>
<td>55,000</td>
<td>188,815</td>
<td>30%</td>
</tr>
<tr>
<td>60,000</td>
<td>205,980</td>
<td>20%</td>
</tr>
<tr>
<td>65,000</td>
<td>223,145</td>
<td>10%</td>
</tr>
<tr>
<td>70,000</td>
<td>240,310</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

The present values of the three highest cash flows all exceed the original outlay of $200,000. The cumulative probability of these three outcomes is 40% (20% + 10% + 10%).

Answer (D) is incorrect because This percentage results from including the lowest three, rather than the highest three, annual cash flows.

Which of the following is not a shortcoming of the internal rate of return (IRR) method.

A. IRR assumes that funds generated from a project will be reinvested at an interest rate equal to the project’s IRR.
B. IRR does not take into account the difference in the scale of investment alternatives.
C. IRR is easier to visualize and interpret than net present value (NPV).
D. Sign changes in the cash flow stream can generate more than one IRR.

Answer (A) is incorrect because IRR assumes that funds generated from a project will be reinvested at an interest rate equal to the project’s IRR.
Answer (B) is incorrect because IRR does not take into account the difference in the scale of investment alternatives.
Answer (C) is correct. IRR is widely used because of its simplicity.
Answer (D) is incorrect because Sign changes in the cash flow stream can generate more than one IRR (the “multiple IRR problem”).

A company is in the process of evaluating a major product line expansion. Using a 14% discount rate, the firm has calculated the present value of both the project’s cash inflows and cash outflows to be $15.8 million. The company will likely evaluate this project further by:

A. Taking a closer look at the expansion’s contribution margin.
B. Comparing the internal rate of return versus the accounting rate of return.
C. Comparing the internal rate of return versus the company’s cost of capital.
D. Comparing the internal rate of return versus the company’s cost of capital and hurdle rate.

Answer (A) is incorrect because Contribution margin is not a comprehensive measure of a project’s profitability.
Answer (B) is incorrect because The accounting rate of return is derived from accrual-basis numbers, making it an inappropriate measure for assessing capital projects.
Answer (C) is incorrect because The cost of capital by itself is not a sufficient measure of the suitability of a capital project.
Answer (D) is correct. The discount rate at which a project’s discounted net cash inflows equal its discounted net cash outflows is referred to as the internal rate of return (IRR). At this discount rate, the project’s net present value is $0. To determine whether a project with a certain IRR is acceptable, this rate of return must be compared with the firm’s current cost of capital and its hurdle rate, i.e., the rate of return that management has chosen as the benchmark for acceptable projects.

With regard to a capital investment project, which one of the following statements best describes the relationship between the cost of capital and the expected internal rate of return?

A. The internal rate of return must exceed the cost of capital for the project to be acceptable.
B. If the internal rate of return exceeds zero, the project will be profitable.
C. The cost of capital must exceed the internal rate of return for the project to be acceptable.
D. The internal rate of return should be compared to a pre-determined benchmark without regard to the cost of capital.

Answer (A) is correct. If the IRR is higher than the company’s desired rate of return (cost of capital), then the investment is desirable. A company will not accept a project with an IRR that is less than the cost of capital.

Answer (B) is incorrect because The IRR is the discount rate at which the investment’s NPV equals zero. Therefore, even if the IRR exceeds zero, it still may be unprofitable.

Answer (C) is incorrect because The internal rate of return must exceed the cost of capital in order for the project to be accepted.

Answer (D) is incorrect because The internal rate of return should not be compared to a pre-determined benchmark without regard to the cost of capital.

National, Inc., is considering three mutually exclusive projects. Each project would involve an initial investment of $7,000 and generate the following cash inflows.

<table>
<thead>
<tr>
<th>Year</th>
<th>Project X</th>
<th>Project Y</th>
<th>Project Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$0</td>
<td>$2,000</td>
<td>$5,000</td>
</tr>
<tr>
<td>2</td>
<td>4,000</td>
<td>3,000</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>2,000</td>
<td>4,000</td>
<td>2,000</td>
</tr>
<tr>
<td>4</td>
<td>5,000</td>
<td>2,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Total</td>
<td>$11,000</td>
<td>$11,000</td>
<td>$11,000</td>
</tr>
</tbody>
</table>

Given a cost of capital of 10%, rank the projects in descending order of net present value (NPV).

A. X, Y, Z.
B. X, Z, Y.
C. Y, Z, X.
D. Z, Y, X.

Answer (A) is incorrect because The projects are ranked in ascending order of net present value; the question asks for descending order.

Answer (B) is incorrect because Project X has the lowest net present value because it receives most of its cash inflows during later periods.

Answer (C) is incorrect because Project Z is more valuable than Project Y.
Answer (D) is correct. The net present value (NPV) nets the expected cash streams related to a project and then discounts them at the hurdle rate. The cost of capital is equal to 10%. Therefore, the NPV for each project can be calculated using the PV factors of $1 at 10% as follows:

<table>
<thead>
<tr>
<th>Periods</th>
<th>PV Factor at 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1.00000</td>
</tr>
<tr>
<td>1</td>
<td>0.90909</td>
</tr>
<tr>
<td>2</td>
<td>0.82645</td>
</tr>
<tr>
<td>3</td>
<td>0.75131</td>
</tr>
<tr>
<td>4</td>
<td>0.68301</td>
</tr>
</tbody>
</table>

Project X: \(-7,000 \times 1\) + \((0 \times 0.90909)\) + \((4,000 \times 0.82645)\) + \((2,000 \times 0.75131)\) + \((5,000 \times 0.68301)\) = $1,224

Project Y: \(-7,000 \times 1\) + \((2,000 \times 0.90909)\) + \((3,000 \times 0.82645)\) + \((4,000 \times 0.75131)\) + \((2,000 \times 0.68301)\) = $1,668

Project Z: \(-7,000 \times 1\) + \((5,000 \times 0.90909)\) + \((0 \times 0.82645)\) + \((2,000 \times 0.75131)\) + \((4,000 \times 0.68301)\) = $1,780

The NPVs can be ranked in descending order as Z ($1,780), Y ($1,668), and X ($1,224).

The primary advantage of using the internal rate of return (IRR) method to evaluate capital budgeting projects is that it

A. Results in decisions that will maximize shareholder wealth.
B. Results in decisions that will maximize income.
C. Is easy to understand and communicate.
D. Assumes a conservative reinvestment rate.

Answer (A) is incorrect because The IRR of an investment is the discount rate at which the investment’s NPV equals 0. In other words, it is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. This would not maximize shareholder wealth.

Answer (B) is incorrect because The IRR of an investment is the discount rate at which the investment’s NPV equals 0. In other words, it is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. This would not maximize income.

Answer (C) is correct. The IRR is easy to understand and communicate. Essentially, if the IRR is higher than the company’s desired rate of return, then the investment is desirable.

Answer (D) is incorrect because The IRR method assumes that the cash flows will be reinvested at the internal rate of return. This does not necessarily assume a conservative reinvestment rate.

A company invested $500,000 in a new project. The project is expected to yield annual incremental cash flows of $175,000 for 4 years. What is the approximate internal rate of return (IRR) for this project?

A. 10%  
B. 15%  
C. 35%  
D. 40%

Answer (A) is incorrect because The IRR of an investment is the discount rate at which the investment’s NPV equals 0. In other words, it is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. The PV factor of an annuity at 10% for a period of 4 years is equal to 3.170 \((175,000 \times 3.170 = 554,750)\). Therefore, 10% is not the IRR because the NPV would equal $54,750 ($554,750 – $500,000).
Answer (B) is correct. The IRR of an investment is the discount rate at which the investment’s NPV equals 0. In other words, it is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. The PV factor of an annuity at 15% for a period of 4 years is equal to 2.855 ($175,000 \times 2.855 = $499,625, which is about $500,000). Therefore, 15% is the IRR because the NPV would equal $0 ($500,000 – $500,000).

Answer (C) is incorrect because The IRR of an investment is the discount rate at which the investment’s NPV equals 0. In other words, it is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. The PV factor of an annuity at 35% for a period of 4 years is equal to 1.997 ($175,000 \times 1.997 = $349,466). Therefore, 35% is not the IRR because the NPV would equal $150,534 ($349,466 – $500,000).

Answer (D) is incorrect because The IRR of an investment is the discount rate at which the investment’s NPV equals 0. In other words, it is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. The PV factor of $175,000 at 40% for a period of 4 years is equal to 1.849 ($175,000 \times 1.849 = $323,615). Therefore, 40% is not the IRR because the NPV would equal $176,385 ($323,615 – $500,000).

One disadvantage of using internal rate of return (IRR) is that it

A. Provides a result that cannot be compared to other projects.
B. May not be used when cash flows vary from positive to negative in different years.
C. Is difficult for managers to understand the results of the calculation.
D. Can only use a limited number of years in calculating the result.

Answer (A) is incorrect because The IRR provides results that can be compared to other projects.
Answer (B) is correct. The IRR may not be used when cash flows vary from positive to negative in different years. When the direction of the cash flows changes, focusing simply on IRR can be misleading. This effect is known as the multiple IRR problem. Essentially, there are as many solutions to the IRR formula as there are changes in the direction of the net cash flows.
Answer (C) is incorrect because The IRR does not make it difficult for managers to understand the results of the calculation.
Answer (D) is incorrect because The IRR is not limited in the number of years it can use to calculate the results.

The Financial Analysis Department of Stover, Inc., has analyzed a proposed capital investment and calculated the appropriate incremental cash flows as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(100,000) outflow</td>
</tr>
<tr>
<td>1</td>
<td>80,000 inflow</td>
</tr>
<tr>
<td>2</td>
<td>80,000 inflow</td>
</tr>
<tr>
<td>3</td>
<td>80,000 inflow</td>
</tr>
<tr>
<td>4</td>
<td>(100,000) outflow</td>
</tr>
</tbody>
</table>

A net present value (NPV) of approximately $25,000 and an internal rate of return (IRR) of minus 29% were calculated for the project, and the project was submitted to the board of directors for approval. Which one of the following statements is correct?

A. The project has another IRR in addition to the minus 29% rate.
B. The IRR calculation must have contained an error.
C. In the NPV calculation, the project’s cash flows are assumed to be reinvested at Stover’s cost of capital.
D. The board of directors should not approve the project.
Answer (A) is **correct**. The multiple IRR effect states that there are as many solutions to the IRR formula as there are changes in the direction of the net cash flows. Because the cash flows change from inflows to outflows from Year 3 to Year 4, another correct solution to the IRR exists.

Answer (B) is **incorrect** because the IRR calculation did not contain an error.

Answer (C) is **incorrect** because the NPV method assumes that the cash flows are reinvested at the desired rate of return, not at the cost of capital.

Answer (D) is **incorrect** because the board of directors should approve this project because it has a positive NPV of $25,000.

---

**Assume that an investment project’s assumed cash flows are not changed, but the assumed weighted-average cost of capital is reduced. What impact would this have on the net present value (NPV) and the internal rate of return (IRR) of this project?**

A. NPV would increase, and IRR would increase.
B. NPV would decrease, and IRR would increase.
C. NPV would not change, and IRR would not change.
D. NPV would increase, and IRR would not change.

- **Answer (A) is incorrect** because the IRR will not increase because the project’s assumed cash flows are not changing. The IRR is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. Thus, the IRR will remain the same.
- **Answer (B) is incorrect** because if the cost of capital is reduced, the PV factors are increased. This would result in a higher discounted cash inflow each year, resulting in a higher NPV, not a decreased NPV. In addition, the IRR will not increase because the project’s assumed cash flows are not changing. The IRR is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows. Thus, the IRR will remain the same.
- **Answer (C) is incorrect** because if the cost of capital is reduced, the PV factors are increased. This would result in a higher discounted cash inflow each year, resulting in a higher NPV, not an unchanged one.
- **Answer (D) is correct**. If the cost of capital is reduced, the PV factors are increased. This would result in a higher discounted cash inflow each year, resulting in a higher NPV. However, because the project’s assumed cash flows are not changed, the IRR will not change. The IRR is the rate that makes the present value of the expected cash inflows equal the present value of the expected cash outflows.
The Eat-Right Company has been disappointed by previous capital budgeting decisions using the payback method. A new requirement has been implemented that requires discounted cash flow analysis to be used to compute the net present value (NPV) of proposed purchases over $300,000. The Food Processing Department of the Eat-Right Company is considering the acquisition of a new machine that will reduce labor costs by a pre-tax amount of $175,000 per year. Other information regarding the possible acquisition is as follows:

- The machine will cost $450,000. Installation charges will amount to an additional $25,000.
- The machine will have a useful life of 3 years, with no salvage value. Depreciation rates for tax purposes are 25%, 38%, and 37% for Years 1, 2, and 3, respectively.
- Eat-Right’s cost of capital, 12%, is considered the appropriate discount rate.
- The income tax rate is 40%.
- Cash flows are assumed to occur at the end of the calendar year, which coincides with Eat-Right’s fiscal year end.

Which of the following best indicates the net present value of the proposed investment and the appropriate acquisition decision?

A. Approximately $73,000; recommend making the investment.
B. Approximately $(73,000); recommend not making the investment.
C. Approximately $55,000; recommend making the investment.
D. Approximately $(55,000); recommend not making the investment.

Answer (A) is incorrect because The correct NPV is negative, not positive, so the investment should not be recommended.

Answer (B) is correct. The net initial investment in Year 0 will be $475,000 ($450,000 + $25,000 installation charges). The annual pre-tax savings per year are stated as $175,000. Therefore, the annual after-tax savings will be $105,000 ($175,000 × (1 – .40)). The depreciation tax shield for each year is calculated as follows:

- Year 1: $475,000 × .25 = $118,750 × .40 = $47,500
- Year 2: $475,000 × .38 = $180,500 × .40 = $72,200
- Year 3: $475,000 × .37 = $175,750 × .40 = $70,300

Now solve for the NPV using the PV factors at 12%:

\[ (-$475,000) + [(105,000 + 47,500) × .893] + [(105,000 + 72,200) × .797] + [(105,000 + 70,300) × .712] \]
\[ = -$72,776 \]

Because the NPV is negative, Eat-Right should not make the investment.

Answer (C) is incorrect because The net initial investment in Year 0 will be $475,000 ($450,000 + $25,000 installation charges). This answer choice incorrectly uses the $450,000 as the net initial investment in Year 0. This is not correct as the $25,000 installation charges must be considered. Additionally, the correct NPV is negative, not positive, so the investment should not be recommended.

Answer (D) is incorrect because The net initial investment in Year 0 will be $475,000 ($450,000 + $25,000 installation charges). This answer choice incorrectly uses the $450,000 as the net initial investment in Year 0. This is not correct as the $25,000 installation charges must be considered. Even though the investment should not be recommended, this is not the correct NPV.

---

Henderson, Inc., has purchased a new fleet of trucks to deliver its merchandise. The trucks have a useful life of 8 years and cost a total of $500,000. Henderson expects its net increase in after-tax cash flow to be $150,000 in Year 1, $175,000 in Year 2, $125,000 in Year 3, and $100,000 in each of the remaining years.
Ignoring the time value of money, how long will it take Henderson to recover the amount of investment?

A. 3.5 years.
B. 4.0 years.
C. 4.2 years.
D. 5 years.

- Answer (A) is correct. The payback period for an investment, ignoring the time value of money, can be found by accumulating each year’s net cash flows until the initial investment is recovered. The amount accumulated after 3 years is $450,000. Thus, 50% of Year 4 cash flows is needed to recover the initial investment. The payback period is 3.5 years.
- Answer (B) is incorrect because Four years includes the additional $50,000 of Year 4.
- Answer (C) is incorrect because This many years take the average inflow of all 8 years and divides that into the $500,000 initial investment.
- Answer (D) is incorrect because Five years uses only the cash flows from the remaining 5 years.

What is the payback reciprocal for Henderson’s fleet of trucks?

A. 29%  
B. 25%  
C. 24%  
D. 20%

- Answer (A) is correct. The payback reciprocal for an investment is found by dividing 1 by the payback time. The payback time for this investment is 3.5 years, and the payback reciprocal is 1 divided by 3.5, or 29%.
- Answer (B) is incorrect because This percentage includes the additional $50,000 of Year 4 in the payback time.
- Answer (C) is incorrect because This percentage takes the average inflow of all 8 years and divides that into the $500,000 initial investment in the payback time.
- Answer (D) is incorrect because This percentage uses only the cash flows from the remaining 5 years in the payback time.

If the net cash flow is $130,000 a year, what is the payback time for Henderson’s fleet of trucks?

A. 3 years.  
B. 3.15 years.  
C. 3.85 years.  
D. 4 years.

- Answer (A) is incorrect because The length of the payback period is 3.85 years.
- Answer (B) is incorrect because The length of the payback period is 3.85 years.
- Answer (C) is correct. The payback period for an investment, ignoring the time value of money, can be found by accumulating each year’s net cash flows until the initial investment is recovered. Therefore, dividing the $500,000 initial investment by the annual $130,000 inflow gives a payback time of 3.85 years.
- Answer (D) is incorrect because Four years does not prorate the final $130,000.
Based on a 6% annual interest rate, what is the discounted payback period for Henderson’s fleet of trucks?

A. 3.5 years.
B. 3.98 years.
C. 4.25 years.
D. 5.0 years.

Answer (A) is incorrect because this number of years is the undiscounted payback period.
Answer (B) is incorrect because this number of years results from not discounting the cash flows in the fourth year.
Answer (C) is correct. The discounted payback period for an investment, assuming a 6% discount, can be found by accumulating each year’s discounted net cash flows until the initial investment is recovered.

\[
\begin{align*}
$150,000 \times 0.94339 &= 141,508.50 \\
175,000 \times 0.88999 &= 155,748.25 \\
125,000 \times 0.83962 &= 104,952.50 \\
100,000 \times 0.79209 &= 79,209.00 \\
\end{align*}
\]

Thus, the answer is something greater than four years. After four years, an additional $18,581.75 ($500,000 – $481,418.25) is needed. The calculation for the fifth year is $74,726 ($100,000 \times 0.74726). Consequently, the discounted payback period is approximately 4.25 years \([4 + (18,581.75 \div 74,726)]\).
Answer (D) is incorrect because the full fifth year is not necessary.

Jasper Company has a payback goal of 3 years on new equipment acquisitions. A new sorter is being evaluated that costs $450,000 and has a 5-year life. Straight-line depreciation will be used; no salvage is anticipated. Jasper is subject to a 40% income tax rate. To meet the company’s payback goal, the sorter must generate reductions in annual cash operating costs of

A. $60,000
B. $100,000
C. $150,000
D. $190,000

Answer (A) is incorrect because the amount of $60,000 is after-tax net income from the cost savings.
Answer (B) is incorrect because the amount of $100,000 is the pre-tax income from the cost savings.
Answer (C) is incorrect because the amount of $150,000 ignores the impact of depreciation and income taxes.
Answer (D) is correct. Given a periodic constant cash flow, the payback period is calculated by dividing cost by the annual cash inflows, or cash savings. To achieve a payback period of 3 years, the annual increment in net cash inflow generated by the investment must be $150,000 ($450,000 \div 3$-year targeted payback period). This amount equals the total reduction in cash operating costs minus related taxes. Depreciation is $90,000 ($450,000 \div 5$ years). Because depreciation is a noncash deductible expense, it shields $90,000 of the cash savings from taxation. Accordingly, $60,000 ($150,000 – $90,000) of the additional net cash inflow must come from after-tax net income. At a 40% tax rate, $60,000 of after-tax income equals $100,000 ($60,000 \div 60\%) of pre-tax income from cost savings, and the outflow for taxes is $40,000. Thus, the annual reduction in cash operating costs required is $190,000 ($150,000 additional net cash inflow required + $40,000 tax outflow).
The capital budgeting model that is generally considered the best model for long-range decision making is the discounted cash flow model.

- Answer (A) is incorrect because the payback method gives no consideration to the time value of money or to returns after the payback period.
- Answer (B) is incorrect because the accounting rate of return does not consider the time value of money.
- Answer (C) is incorrect because the unadjusted rate of return does not consider the time value of money.
- Answer (D) is correct. The capital budgeting methods that are generally considered the best for long-range decision making are the internal rate of return and net present value methods. These are both discounted cash flow methods.

When evaluating projects, breakeven time is best described as

- Answer (A) is incorrect because it is related to breakeven point, not breakeven time.
- Answer (B) is incorrect because the payback period equals investment divided by annual undiscounted net cash inflows.
- Answer (C) is incorrect because the payback period is the period required for total undiscounted cash inflows to equal total undiscounted cash outflows.
- Answer (D) is correct. Breakeven time is a capital budgeting tool that is widely used to evaluate the rapidity of new product development. It is the period required for the discounted cumulative cash inflows for a project to equal the discounted cumulative cash outflows. The concept is similar to the payback period, but it is more sophisticated because it incorporates the time value of money. It also differs from the payback method because the period covered begins at the outset of a project, not when the initial cash outflow occurs.
Irwinn Co. is considering an investment in a capital project. The sole outlay will be $800,000 at the outset of the project, and the annual net after-tax cash inflow will be $216,309.75 for 6 years. The present value factors at Irwinn’s 8% cost of capital are

<table>
<thead>
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<th>Year</th>
<th>PV Factors</th>
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<tbody>
<tr>
<td>1</td>
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<td>3</td>
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<td>4</td>
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<td>5</td>
<td>.681</td>
</tr>
<tr>
<td>6</td>
<td>.630</td>
</tr>
</tbody>
</table>

What is the breakeven time (BET)?

A. 3.70 years.
B. 4.57 years.
C. 5.00 years.
D. 6.00 years.

- Answer (A) is incorrect because this number of years is the regular payback period.
- Answer (B) is correct. Breakeven time is a more sophisticated version of the payback method. Breakeven time is defined as the period required for the discounted cumulative cash inflows on a project to equal the discounted cumulative cash outflows (usually the initial cost). Thus, it is the time necessary for the present value of the discounted cash flows to equal zero. This period begins at the outset of a project, not when the initial cash outflow occurs. Accordingly, the BET is calculated as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>After-Tax Cash Flow</th>
<th>PV of Inflow</th>
<th>Cumulative PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$216,309.75</td>
<td>$200,302.83</td>
<td>$200,302.83</td>
</tr>
<tr>
<td>2</td>
<td>216,309.75</td>
<td>185,377.46</td>
<td>385,680.29</td>
</tr>
<tr>
<td>3</td>
<td>216,309.75</td>
<td>171,749.94</td>
<td>557,430.23</td>
</tr>
<tr>
<td>4</td>
<td>216,309.75</td>
<td>158,987.67</td>
<td>716,417.90</td>
</tr>
<tr>
<td>5</td>
<td>216,309.75</td>
<td>147,306.94</td>
<td></td>
</tr>
</tbody>
</table>

Amount required in Year 5:

$800,000 – $716,417.90 = $83,582.10

BET = 4 years + ($83,582.10 ÷ $147,306.94) = 4.57 years

- Answer (C) is incorrect because interpolation is necessary to determine the BET.
- Answer (D) is incorrect because the duration of net after-tax cash inflows is 6.00 years.

A characteristic of the payback method (before taxes) is that it

A. Incorporates the time value of money.
B. Neglects total project profitability.
C. Uses accrual accounting inflows in the numerator of the calculation.
D. Uses the estimated expected life of the asset in the denominator of the calculation.

- Answer (A) is incorrect because the payback method does not incorporate the time value of money.
Answer (B) is correct. The payback method calculates the number of years required to complete the return of the original investment. This measure is computed by dividing the net investment required by the average expected cash flow to be generated, resulting in the number of years required to recover the original investment. Payback is easy to calculate but has two principal problems: it ignores the time value of money, and it gives no consideration to returns after the payback period. Thus, it ignores total project profitability.

Answer (C) is incorrect because The payback method uses the net investment in the numerator of the calculation.

Answer (D) is incorrect because Payback uses the net annual cash inflows in the denominator of the calculation.

The length of time required to recover the initial cash outlay of a capital project is determined by using the

A. Discounted cash flow method.
B. Payback method.
C. Weighted net present value method.
D. Net present value method.

Answer (A) is incorrect because The discounted cash flow method computes a rate of return.

Answer (B) is correct. The payback method measures the number of years required to complete the return of the original investment. This measure is computed by dividing the net investment by the average expected cash inflows to be generated, resulting in the number of years required to recover the original investment. The payback method gives no consideration to the time value of money, and there is no consideration of returns after the payback period.

Answer (C) is incorrect because The net present value method is based on discounted cash flows; the length of time to recover an investment is not the result.

Answer (D) is incorrect because The net present value method is based on discounted cash flows; the length of time to recover an investment is not the result.

Which one of the following statements about the payback method of investment analysis is correct? The payback method

A. Does not consider the time value of money.
B. Considers cash flows after the payback has been reached.
C. Uses discounted cash flow techniques.
D. Generally leads to the same decision as other methods for long-term projects.

Answer (A) is correct. The payback method calculates the amount of time required to complete the return of the original investment, i.e., the time it takes for a new asset to pay for itself. Although the payback method is easy to calculate, it has inherent problems. The time value of money and returns after the payback period are not considered.

Answer (B) is incorrect because The payback method ignores cash flows after payback.

Answer (C) is incorrect because The payback method does not use discounted cash flow techniques.

Answer (D) is incorrect because The payback method may lead to different decisions.

The payback reciprocal can be used to approximate a project’s

A. Profitability index.
B. Net present value.
C. Accounting rate of return if the cash flow pattern is relatively stable.
D. Internal rate of return if the cash flow pattern is relatively stable.
• Answer (A) is incorrect because the payback reciprocal is not related to the profitability index.
• Answer (B) is incorrect because the payback reciprocal approximates the IRR, which is the rate at which the NPV is $0.
• Answer (C) is incorrect because the accounting rate of return is based on accrual-income based figures, not on discounted cash flows.
• Answer (D) is correct. The payback reciprocal (1 ÷ payback) has been shown to approximate the internal rate of return (IRR) when the periodic cash flows are equal and the life of the project is at least twice the payback period.

[1532] The bailout payback method

A. Incorporates the time value of money.
B. Equals the recovery period from normal operations.
C. Eliminates the disposal value from the payback calculation.
D. Measures the risk if a project is terminated.

• Answer (A) is incorrect because the bailout payback method does not consider the time value of money.
• Answer (B) is incorrect because the bailout payback includes salvage value as well as cash flow from operations.
• Answer (C) is incorrect because the bailout payback incorporates the disposal value in the payback calculation.
• Answer (D) is correct. The payback period equals the net investment divided by the average expected cash flow, resulting in the number of years required to recover the original investment. The bailout payback incorporates the salvage value of the asset into the calculation. It determines the length of the payback period when the periodic cash inflows are combined with the salvage value. Hence, the method measures risk. The longer the payback period, the more risky the investment.

[1533] Whatney Co. is considering the acquisition of a new, more efficient press. The cost of the press is $360,000, and the press has an estimated 6-year life with zero salvage value. Whatney uses straight-line depreciation for both financial reporting and income tax reporting purposes and has a 40% corporate income tax rate. In evaluating equipment acquisitions of this type, Whatney uses a goal of a 4-year payback period. To meet Whatney’s desired payback period, the press must produce a minimum annual before-tax operating cash savings of

A. $90,000
B. $110,000
C. $114,000
D. $150,000

• Answer (A) is incorrect because the amount of $90,000 is the total desired annual after-tax cash savings.
• Answer (B) is correct. Payback is the number of years required to complete the return of the original investment. Given a periodic constant cash flow, the payback period equals net investment divided by the constant expected periodic after-tax cash flow. The desired payback period is 4 years, so the constant after-tax annual cash flow must be $90,000 ($360,000 ÷ 4). Assuming that the company has sufficient other income to permit realization of the full tax savings, depreciation of the machine will shield $60,000 ($360,000 ÷ 6) of income from taxation each year, an after-tax cash savings of $24,000 ($60,000 × 40%). Thus, the machine must generate an additional $66,000 ($90,000 – $24,000) of after-tax cash savings from operations. This amount is equivalent to $110,000 [$66,000 ÷ (1.0 – .4)] of before-tax operating cash savings.
• Answer (C) is incorrect because the amount of $114,000 results from adding, not subtracting, the $24,000 of tax depreciation savings to determine the minimum annual after-tax operating savings.
• Answer (D) is incorrect because the amount of $150,000 assumes that depreciation is not tax deductible.
[Fact Pattern #161]
The Dickins Corporation is considering the acquisition of a new machine at a cost of $180,000. Transporting the machine to Dickins’ plant will cost $12,000. Installing the machine will cost an additional $18,000. It has a 10-year life and is expected to have a salvage value of $10,000. Furthermore, the machine is expected to produce 4,000 units per year with a selling price of $500 and combined direct materials and direct labor costs of $450 per unit. Federal tax regulations permit machines of this type to be depreciated using the straight-line method over 5 years with no estimated salvage value. Dickins has a marginal tax rate of 40%.

What is the approximate payback period on Dickins’ new machine?

A. 1.05 years.  
B. 1.54 years.  
C. 1.33 years.  
D. 2.22 years.

- Answer (A) is incorrect because this number of years fails to subtract income taxes.
- Answer (B) is correct.

The company will receive net cash inflows of $50 per unit ($500 selling price – $450 variable costs), a total of $200,000 per year for 4,000 units. This amount will be subject to taxation. However, for the first 5 years, a depreciation deduction of $42,000 per year ($210,000 ÷ 5 years) will be available. Thus, annual taxable income will be $158,000 ($200,000 – $42,000). At a 40% tax rate, income tax expense will be $63,200, and the net cash inflow will be $136,800 ($200,000 – $63,200). When annual cash inflows are uniform, the payback period is calculated by dividing the initial investment ($210,000) by the annual net cash inflows ($136,800). Dividing $210,000 by $136,800 produces a payback period of 1.54 years.

- Answer (C) is incorrect because this number of years includes taxable income in the denominator instead of cash flows.
- Answer (D) is incorrect because this number of years subtracts depreciation from cash flows.

[1534] Fitzgerald Company is planning to acquire a $250,000 machine that will provide increased efficiencies, thereby reducing annual operating costs by $80,000. The machine will be depreciated by the straight-line method over a 5-year life with no salvage value at the end of 5 years. Assuming a 40% income tax rate, the machine’s payback period is

A. 3.13 years.  
B. 8.33 years.  
C. 3.68 years.  
D. 5.21 years.

- Answer (A) is incorrect because this figure does not take the increase in tax expense into account.
- Answer (B) is incorrect because this figure deducts depreciation in the calculation of annual cash flows.
- Answer (C) is correct. The payback period is the number of years required to complete the return of the original investment. This measure is computed by dividing the net investment required by the average expected net cash inflow to be generated. The first step is to determine the annual cash flow. The $80,000 cost reduction will be offset by the tax expense on the savings. The full $80,000, however, will not be taxable because depreciation can be deducted before computing income taxes. Allocating the $250,000 cost evenly over 5 years produces an annual depreciation expense of $50,000. Thus, taxable income will be $30,000 ($80,000 – $50,000). At a 40% tax rate, the tax on $30,000 is $12,000. The net annual cash inflow is therefore $68,000 ($80,000 – $12,000), and the payback period is 3.68 years ($250,000 investment ÷ $68,000).
- Answer (D) is incorrect because this figure does not include the effect of depreciation on taxable income.
When ranking two mutually exclusive investments with different initial amounts, management should give first priority to the project

A. That generates cash flows for the longer period of time.
B. Whose net after-tax flows equal the initial investment.
C. That has the greater accounting rate of return.
D. That has the greater profitability index.

- Answer (A) is incorrect because the investment generating cash flows the longest may not have the best return.
- Answer (B) is incorrect because given a net present value of zero (a profitability index exactly equal to one), the investor would be indifferent to the project.
- Answer (C) is incorrect because the accounting rate of return is not a good measure of profitability. It ignores the time value of money.
- Answer (D) is correct. The profitability index (excess present value index) facilitates the comparison of investments that have different initial costs. The profitability index is the ratio of the present value of the future net cash flows (or only cash inflows) to the net initial investment. The investment with the greater profitability index will be the preferred investment.

The bailout payback method

A. Is used by firms with federally insured loans.
B. Calculates the payback period using the sum of the net cash flows and the salvage value.
C. Calculates the payback period using the difference between net cash inflow and the salvage value.
D. Estimates short-term profitability.

- Answer (A) is incorrect because the use of the bailout payback method is not limited to firms with federally insured loans.
- Answer (B) is correct. The bailout payback period is the length of time required for the sum of the cumulative net cash inflow from an investment and its salvage value to equal the original investment. The bailout payback method measures the risk to the investor if the investment must be abandoned. The shorter the period, the lower the risk.
- Answer (C) is incorrect because the payback period is calculated by summing the net cash inflow and the salvage value.
- Answer (D) is incorrect because the bailout payback method does not estimate short-term profitability.
Fact Pattern #162

Jorelle Company’s financial staff has been requested to review a proposed investment in new capital equipment. Applicable financial data is presented below. There will be no salvage value at the end of the investment’s life and, due to realistic depreciation practices, it is estimated that the salvage value and net book value are equal at the end of each year. All cash flows are assumed to take place at the end of each year. For investment proposals, Jorelle uses a 12% after-tax target rate of return.

### Investment Proposal

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<th>Year</th>
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Discounted Factors for a 12% Rate of Return

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<th>Year</th>
<th>Present Value of $1.00 Received at the End of Each Period</th>
<th>Present Value of an Annuity of $1.00 Received at the End of Each Period</th>
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[1538] Refers to Fact Pattern #162

The accounting rate of return on the average investment proposal is

A. 12.0%
B. 17.2%
C. 28.0%
D. 34.4%

- Answer (A) is incorrect because this percentage is the discount rate.
- Answer (B) is incorrect because this percentage equals $43,000 divided by $250,000.
- Answer (C) is incorrect because this percentage equals $35,000 divided by $125,000.
- Answer (D) is correct. The accounting rate of return (unadjusted rate of return or book value rate of return) equals accounting net income divided by the required average investment. The accounting rate of return ignores the time value of money. The average income over 5 years is $43,000 per year \([($35,000 + $39,000 + $43,000 + $47,000 + $51,000) \div 5]\). Hence, the accounting rate of return is 34.4% \([$43,000 \div ($250,000 \div 2)]\).
The net present value for the investment proposal is

A. $106,160
B. $(97,970)
C. $356,160
D. $96,560

- Answer (A) is correct. The NPV is the sum of the present values of all cash inflows and outflows associated with the proposal. If the NPV is positive, the proposal should be accepted. The NPV is determined by discounting each expected cash flow using the appropriate 12% interest factor for the present value of $1. Thus, the NPV is $106,160 \[ (.89 \times $120,000) + (.80 \times $108,000) + (.71 \times $96,000) + (.64 \times $84,000) + (.57 \times $72,000) – (1.00 \times $250,000) \].
- Answer (B) is incorrect because the amount of $(97,970) is based on net income instead of cash flows.
- Answer (C) is incorrect because the amount of $356,160 excludes the purchase cost.
- Answer (D) is incorrect because the amount of $96,560 equals average after-tax cash inflow times the interest factor for the present value of a 5-year annuity, minus $250,000.

The traditional payback period for the investment proposal is

A. Over 5 years.
B. 2.23 years.
C. 1.65 years.
D. 2.83 years.

- Answer (A) is incorrect because the 5-year total expected cash inflow is $480,000.
- Answer (B) is correct. The traditional payback period is the number of periods required for the undiscounted expected cash flows to equal the original investment. When periodic cash flows are not expected to be uniform, a cumulative calculation is necessary. The first year’s cash inflow is $120,000. Adding another $108,000 in Year 2 brings the total payback after 2 years to $228,000. Accordingly, the traditional payback period is about 2.23 years \[ 2 + \left( \frac{$250,000 - $228,000}{$96,000 \text{ cash inflow in Year 3}} \right) \].
- Answer (C) is incorrect because the total expected cash flow for 1.65 years is $190,200.
- Answer (D) is incorrect because the total expected cash flow for 2.83 years is $307,680.
The following methods are used to evaluate capital investment projects:

- Internal rate of return
- Average rate of return
- Payback
- Net present value

Which one of the following correctly identifies the methods that utilize discounted cash-flow (DCF) techniques?

<table>
<thead>
<tr>
<th>Internal Rate of Return</th>
<th>Average Rate of Return</th>
<th>Payback</th>
<th>Net Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>B. No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>C. Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>D. Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because Average rate of return does not use DCF, and net present value does.
- Answer (B) is incorrect because Internal rate of return is a DCF method, and payback is not.
- Answer (C) is incorrect because Payback is not a DCF method, and net present value is.
- Answer (D) is correct. The internal rate of return (IRR) is the discount rate at which a capital investment’s net present value (NPV) equals zero. Both IRR and NPV, therefore, require the use of discounted cash flows. The average rate of return and payback methods use accrual-basis figures and thus are not DCF methods.

Which one of the following methods for evaluating capital projects is the least useful from an investment analysis point of view?

A. Accounting rate of return.
B. Internal rate of return.
C. Net present value.
D. Payback.

- Answer (A) is correct. The accounting, or book, rate of return is an unsatisfactory means of evaluating capital projects for two major reasons. Because the accounting rate of return uses accrual-basis numbers, the calculation is subject to such accounting judgments as how quickly to depreciate capitalized assets. Also, the accounting rate of return is an average of all of a firm’s capital projects; it reveals nothing about the performance of individual investment choices.
- Answer (B) is incorrect because Internal rate of return, which uses discounted cash flows, can be a useful method for evaluating capital projects.
- Answer (C) is incorrect because Net present value, which uses discounted cash flows, is generally the most useful method for evaluating capital projects.
- Answer (D) is incorrect because The payback method can be useful for those firms that have set a minimum length of time within which projects must pay for themselves.
Two mutually exclusive capital expenditure projects have the following characteristics:

<table>
<thead>
<tr>
<th></th>
<th>Project A</th>
<th>Project B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$100,000</td>
<td>$150,000</td>
</tr>
</tbody>
</table>
| Net cash inflows:
  Year 1        | 40,000    | 80,000    |
  Year 2        | 50,000    | 70,000    |
  Year 3        | 60,000    | 60,000    |

All cash flows are received at the end of the year. Based on this information, which one of the following statements is not correct?

A. The net present value of Project A at a cost of capital of 10% is $22,720.
B. The net present value of Project B at a cost of capital of 12% is $19,950.
C. The internal rate of return of Project B is greater than the internal rate of return of Project A.
D. The payback period for Project A is longer than the payback period for Project B.

- Answer (A) is incorrect because the net present value of Project A at a cost of capital of 10% is $22,720.
- Answer (B) is incorrect because the net present value of Project B at a cost of capital of 12% is $19,950.
- Answer (C) is correct. Calculating internal rate of return requires multiple present value calculations. This can be selected as the correct answer by a process of elimination. The net present value of Project A discounted at 10% can be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>PV Factor</th>
<th>Discounted Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>1.000</td>
<td>$(100,000)</td>
</tr>
<tr>
<td>Year 1 inflows</td>
<td>0.909</td>
<td>36,360</td>
</tr>
<tr>
<td>Year 2 inflows</td>
<td>0.826</td>
<td>41,300</td>
</tr>
<tr>
<td>Year 3 inflows</td>
<td>0.751</td>
<td>45,060</td>
</tr>
<tr>
<td>Project A net present value</td>
<td></td>
<td>$22,720</td>
</tr>
</tbody>
</table>

Thus, the net present value of Project A at a cost of capital of 10% is $22,720, so this statement cannot be the correct answer. The net present value of Project B discounted at 12% can be calculated as follows:

<table>
<thead>
<tr>
<th></th>
<th>PV Factor</th>
<th>Discounted Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>1.000</td>
<td>$(150,000)</td>
</tr>
<tr>
<td>Year 1 inflows</td>
<td>0.893</td>
<td>71,440</td>
</tr>
<tr>
<td>Year 2 inflows</td>
<td>0.797</td>
<td>55,790</td>
</tr>
<tr>
<td>Year 3 inflows</td>
<td>0.712</td>
<td>42,720</td>
</tr>
<tr>
<td>Project A net present value</td>
<td></td>
<td>$19,950</td>
</tr>
</tbody>
</table>

Thus, the net present value of Project B at a cost of capital of 12% is $19,950, so this statement cannot be the correct answer. The payback period for Project A consists of 2 full years ([($40,000 Year 1 inflow + $50,000 Year 2 inflow) < $100,000 investment], plus a fraction of a year calculated as follows: {[(100,000 – (40,000 + $50,000)] ÷ 60,000 Year 3 inflow = .167}. The payback period for Project B is exactly 2 years ($80,000 Year 1 inflow + $70,000 Year 2 inflow = $150,000 investment). Since Project A’s payback period of 2.167 years > Project B’s period of 2 years, the payback period for Project A is longer than the payback period for Project B, so this statement cannot be the correct answer.

- Answer (D) is incorrect because the payback period for Project A is 2.167 years, and the period for Project B is only 2 years.
Jones & Company is considering the acquisition of scanning equipment to mechanize its procurement process. The equipment will require extensive testing and debugging as well as user training prior to its operational use. Projected after-tax cash flows are as follows:

<table>
<thead>
<tr>
<th>Time Period</th>
<th>After-Tax Cash Inflow/(Outflow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$(600,000)</td>
</tr>
<tr>
<td>1</td>
<td>$(500,000)</td>
</tr>
<tr>
<td>2</td>
<td>450,000</td>
</tr>
<tr>
<td>3</td>
<td>450,000</td>
</tr>
<tr>
<td>4</td>
<td>350,000</td>
</tr>
<tr>
<td>5</td>
<td>250,000</td>
</tr>
</tbody>
</table>

Management anticipates the equipment will be sold at the beginning of Year 6 for $50,000 and its book value will be zero. Jones’ internal hurdle and effective income tax rates are 14% and 40%, respectively. Based on this information, a negative net present value was computed for the project. Accordingly, it can be concluded that:

A. The project has an internal rate of return (IRR) less than 14% since IRR is the interest rate at which net present value is equal to zero.
B. Jones should examine the determinants of its hurdle rate further before analyzing any other potential projects.
C. Jones should calculate the project payback to determine if it is consistent with the net present value calculation.
D. The project has an IRR greater than 14% since IRR is the interest rate at which net present value is equal to zero.

- Answer (A) is correct. If a project’s NPV is negative at a given hurdle rate, the project can only be made profitable if the rate is lowered. The IRR of this project must therefore be something less than 14%.
- Answer (B) is incorrect because there is no evidence from this decision that Jones’ hurdle rate is inadequate.
- Answer (C) is incorrect because payback and net present value are unrelated.
- Answer (D) is incorrect because the project’s IRR must be less than 14%.

[Fact Pattern #163]
Hobart Corporation evaluates capital projects using a variety of performance screens, including a hurdle rate of 16%, payback period of 3 years or less, and an accounting rate of return of 20% or more.
Hobart’s management is completing review of a project on the basis of the following projections:

- Capital investment: $200,000
- Annual cash flows: $74,000
- Straight-line depreciation: 5 years
- Terminal value: $20,000

The projected internal rate of return is 20%. Which one of the following alternatives reflects the appropriate conclusions for the indicated evaluative measures.

<table>
<thead>
<tr>
<th>Internal Rate of Return</th>
<th>Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Accept</td>
<td>Reject</td>
</tr>
<tr>
<td>B. Reject</td>
<td>Reject</td>
</tr>
<tr>
<td>C. Accept</td>
<td>Accept</td>
</tr>
<tr>
<td>D. Reject</td>
<td>Accept</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because The payback method also produces a decision to accept.
- Answer (B) is incorrect because The project is acceptable under both methods.
- Answer (C) is correct. A capital project is acceptable if its internal rate of return is greater than the firm’s hurdle rate. Since the internal rate of return for this project (20%) exceeds the hurdle rate (16%), it is acceptable on that basis. Under the payback method, the undiscounted cash inflows must exceed the undiscounted cash outflows within a specified period. Since it takes less than 3 years for the inflows from this project to exceed the outflows ($200,000 ÷ $74,000 = 2.7), the decision under this method is also to accept.
- Answer (D) is incorrect because The internal rate of return method also produces the decision to accept.

Despite its shortcomings, the traditional payback period continues to be a popular method to evaluate investments because, in part, i.

- A. Provides some insight into the risk associated with a project.
- B. Ignores the time value of money.
- C. Focuses on income rather than cash flow.
- D. Furnishes information about an investment’s lifetime performance.

- Answer (A) is correct. To some extent, the traditional payback method measures risk. The longer the project takes to payoff, the riskier it is.
- Answer (B) is incorrect because The fact that it ignores the time value of money is one of the method’s shortcomings.
- Answer (C) is incorrect because The traditional payback method focuses on cash flow.
- Answer (D) is incorrect because One of the shortcomings of the traditional payback method is that it ignores all cash flows after the payback point.
Which one of the following is not a shortcoming of the payback method.

A. It offers no consideration of cash flows beyond the expiration of the payback period.
B. It ignores the time value of money.
C. It offers no indication of a project’s liquidity.
D. It encourages establishing a short payback period.

- Answer (A) is incorrect because one of the shortcomings of the traditional payback method is that it ignores all cash flows after the payback point.
- Answer (B) is incorrect because one of the shortcomings of the traditional payback method is that it ignores the time value of money.
- Answer (C) is correct. The payback method does provide a rough indication of a project’s liquidity. The shorter a project’s payback period, the sooner it will produce cash flows that can be put to other purposes.
- Answer (D) is incorrect because one of the shortcomings of the traditional payback method is that it can lead to the rejection of profitable projects that have long payback periods.

Quint Company uses the payback method as part of its analysis of capital investments. One of its projects requires a $140,000 investment and has the following projected before-tax cash flows.

<table>
<thead>
<tr>
<th>Year</th>
<th>Before-Tax Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$60,000</td>
</tr>
<tr>
<td>2</td>
<td>60,000</td>
</tr>
<tr>
<td>3</td>
<td>60,000</td>
</tr>
<tr>
<td>4</td>
<td>80,000</td>
</tr>
<tr>
<td>5</td>
<td>80,000</td>
</tr>
</tbody>
</table>

Quint has an effective 40% tax rate. Based on these data, the after-tax payback period is.

A. 1.5 years.
B. 2.3 years.
C. 3.4 years.
D. 3.7 years.

- Answer (A) is incorrect because the period of 1.5 years reduces the initial investment by a tax factor.
- Answer (B) is incorrect because the period of 2.3 years results from using before-tax, rather than after-tax, cash flows.
- Answer (C) is incorrect because the period of 3.4 years results from using a before-tax inflow of $80,000 in Year 3.
- Answer (D) is correct. The payback period for this project can be calculated as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Before-Tax Cash Flow</th>
<th>Tax Effect</th>
<th>After-Tax Cash Flow</th>
<th>Remaining Initial Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>$140,000</td>
</tr>
<tr>
<td>1</td>
<td>$60,000</td>
<td>60%</td>
<td>$36,000</td>
<td>104,000</td>
</tr>
<tr>
<td>2</td>
<td>60,000</td>
<td>60%</td>
<td>36,000</td>
<td>68,000</td>
</tr>
<tr>
<td>3</td>
<td>60,000</td>
<td>60%</td>
<td>36,000</td>
<td>32,000</td>
</tr>
<tr>
<td>4</td>
<td>80,000</td>
<td>60%</td>
<td>48,000</td>
<td>--</td>
</tr>
</tbody>
</table>

The cumulative inflows exceed the total outflows between Year 3 and Year 4. The fraction of the year can be interpolated by dividing the initial investment remaining unrecovered at the end of Year 3 by the after-tax inflow from Year 4 ($32,000 ÷ $48,000 = 0.6667), for a total payback period of approximately 3.7 years.
Miller, Inc., uses straight-line depreciation for both tax and financial reporting purposes. The following data relate to Machine No. 108, which cost $400,000 and is being written off over a 5-year life.

<table>
<thead>
<tr>
<th>Year</th>
<th>Operating Income</th>
<th>Savings in Cash Operating Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$150,000</td>
<td>$230,000</td>
</tr>
<tr>
<td>2</td>
<td>200,000</td>
<td>280,000</td>
</tr>
<tr>
<td>3</td>
<td>225,000</td>
<td>305,000</td>
</tr>
<tr>
<td>4</td>
<td>225,000</td>
<td>305,000</td>
</tr>
<tr>
<td>5</td>
<td>175,000</td>
<td>255,000</td>
</tr>
</tbody>
</table>

All of these amounts are on a before-tax basis. Miller is subject to a 40% income tax rate. The company strives for a 12% rate of return. The traditional payback period for Machine No. 108 would be:

A. 2.14 years.
B. 2.44 years.
C. 2.58 years.
D. 3.41 years.

- Answer (A) is correct. The after-tax payback for the first 3 years would be calculated as follows:

<table>
<thead>
<tr>
<th>Taxable Income</th>
<th>Tax</th>
<th>Net cash flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>150,000 × 40%</td>
<td>60,000</td>
<td>170,000</td>
</tr>
<tr>
<td>200,000 × 40%</td>
<td>80,000</td>
<td>200,000</td>
</tr>
<tr>
<td>225,000 × 40%</td>
<td>90,000</td>
<td>215,000</td>
</tr>
</tbody>
</table>

By the end of 2 years, the total recovery would be $370,000 ($170,000 + 200,000). Subtracting $370,000 from the $400,000 initial cost leaves $30,000 to be recovered in Year 3. The $30,000 represents 14% of the Year 3 inflows of $215,000. Thus, the total payback period would be 2.14 years.

- Answer (B) is incorrect because the period of 2.44 years used a 60% tax rate rather than 40%.
- Answer (C) is incorrect because the period of 2.58 years calculated taxes on cash flows rather than on income.
- Answer (D) is incorrect because the period of 3.41 years deducted tax payments from income rather than cash flows.

Barker, Inc., has no capital rationing constraint and is analyzing many independent investment alternatives. Barker should accept all investment proposals.

A. If debt financing is available for them.
B. That have positive cash flows.
C. That provide returns greater than the before-tax cost of debt.
D. That have a positive net present value.

- Answer (A) is incorrect because the mere availability of financing is not the only consideration; more important is the cost of the financing, which must be less than the rate of return on the proposed investment.
- Answer (B) is incorrect because an investment with positive cash flows may be a bad investment due to the time value of money; cash flows in later years are not as valuable as those in earlier years.
- Answer (C) is incorrect because returns should exceed the desired rate of return.
- Answer (D) is correct. A company should accept any investment proposal, unless some are mutually exclusive, that has a positive net present value or an internal rate of return greater than the company’s desired rate of return.
The profitability index approach to investment analysis

A. Fails to consider the timing of project cash flows.
B. Considers only the project’s contribution to net income and does not consider cash flow effects.
C. Always yields the same accept/reject decisions for independent projects as the net present value method.
D. Always yields the same accept/reject decisions for mutually exclusive projects as the net present value method.

- Answer (A) is incorrect because The profitability index, like the NPV method, discounts cash flows based on the cost of capital.
- Answer (B) is incorrect because The profitability index is cash based.
- Answer (C) is correct. The profitability index (excess present value index) of an investment is the ratio of the present value of the future net cash flows (or only cash inflows) to the net initial investment. It is a variation of the net present value (NPV) method and facilitates the comparison of different-sized investments. Because it is based on the NPV method, the profitability index will yield the same decision as the NPV for independent projects. However, decisions may differ for mutually exclusive projects of different sizes.
- Answer (D) is incorrect because The NPV and the profitability index may yield different decisions if projects are mutually exclusive and of different sizes.

If an investment project has a profitability index of 1.15, the

A. Project’s internal rate of return is 15%.
B. Project’s cost of capital is greater than its internal rate of return.
C. Project’s internal rate of return exceeds its net present value.
D. Net present value of the project is positive.

- Answer (A) is incorrect because The IRR is the discount rate at which the NPV is $0, which is also the rate at which the profitability index is 1.0. The IRR cannot be determined solely from the index.
- Answer (B) is incorrect because If the index is 1.15 and the discount rate is the cost of capital, the NPV is positive, and the IRR must be higher than the cost of capital.
- Answer (C) is incorrect because The IRR is a discount rate, whereas the NPV is an amount.
- Answer (D) is correct. The profitability index (excess present value index) of an investment is the ratio of the present value of the future net cash flows (or only cash inflows) to the net initial investment. It is a variation of the NPV method that facilitates comparison of different-sized investments. A profitability index greater than 1.0 indicates a profitable investment, i.e., one that has a positive net present value.

The technique used to evaluate all possible capital projects of different dollar amounts and then rank them according to their desirability is the

A. Profitability index method.
B. Net present value method.
C. Payback method.
D. Discounted cash flow method.
Answer (A) is correct. The profitability index (excess present value index) of an investment is the ratio of the present value of the future net cash flows (or only cash inflows) to the net initial investment; that is, the figures are those used to calculate the net present value (NPV), but the numbers are divided rather than subtracted. This variation of the NPV method facilitates comparison of different-sized investments. It provides an optimal ranking in the absence of capital rationing.

Answer (B) is incorrect because the net present value method does not provide a return per dollar invested and is therefore not as effective as the profitability index in the absence of capital rationing.

Answer (C) is incorrect because the payback method gives no consideration to the time value of money or to returns after the payback period.

Answer (D) is incorrect because the profitability index method and the NPV method are discounted cash flow methods. However, the profitability index method is the variant that purports to calculate a return per dollar of investment.

The profitability index (excess present value index)

A. Represents the ratio of the discounted net cash outflows to cash inflows.
B. Is the relationship between the net discounted cash inflows less the discounted cash outflows divided by the discounted cash outflows.
C. Is calculated by dividing the discounted profits by the cash outflows.
D. Is the ratio of the discounted net cash inflows to discounted cash outflows.

Answer (A) is incorrect because the cash inflows are also discounted in the profitability index.

Answer (B) is incorrect because the numerator is the discounted net cash inflows.

Answer (C) is incorrect because the profitability index is based on cash flows, not profits.

Answer (D) is correct. The profitability index (excess present value index) of an investment is the ratio of the present value of the future net cash flows (or only cash inflows) to the net initial investment. This tool is a variation of the NPV method that facilitates comparison of different-sized investments.

The method that divides a project’s annual after-tax net income by the average investment cost to measure the estimated performance of a capital investment is the

A. Internal rate of return method.
B. Accounting rate of return method.
C. Payback method.
D. Net present value (NPV) method.

Answer (A) is incorrect because the internal rate of return is the rate at which NPV is zero. The minimum desired rate of return is not used in the discounting.

Answer (B) is correct. The accounting rate of return uses undiscounted net income (not cash flows) to determine a rate of profitability. Annual after-tax net income is divided by the average carrying amount (or the initial value) of the investment in assets.

Answer (C) is incorrect because the payback period is the time required to complete the return of the original investment. This method gives no consideration to the time value of money or to returns after the payback period.

Answer (D) is incorrect because the NPV method computes the discounted present value of future cash inflows to determine whether it is greater than the initial cash outflow.
If income tax considerations are ignored, how is depreciation handled by the following capital budgeting techniques?

<table>
<thead>
<tr>
<th>Internal Rate of Return</th>
<th>Accounting Rate of Return</th>
<th>Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Excluded</td>
<td>Included</td>
<td>Excluded</td>
</tr>
<tr>
<td>B. Included</td>
<td>Excluded</td>
<td>Included</td>
</tr>
<tr>
<td>C. Excluded</td>
<td>Excluded</td>
<td>Included</td>
</tr>
<tr>
<td>D. Included</td>
<td>Included</td>
<td>Included</td>
</tr>
</tbody>
</table>

- **Answer (A)** is correct. If taxes are ignored, depreciation is not a consideration in any of the methods based on cash flows because it is a non-cash expense. Thus, the internal rate of return, net present value, and payback methods would not consider depreciation because these methods are based on cash flows. However, the accounting rate of return is based on net income as calculated on an income statement. Because depreciation is included in the determination of accrual accounting net income, it would affect the calculation of the accounting rate of return.
- **Answer (B)** is incorrect because The IRR and the payback period are based on cash flows. Depreciation is not needed in their calculation. However, the accounting rate of return cannot be calculated without first deducting depreciation.
- **Answer (C)** is incorrect because The IRR and the payback period are based on cash flows. Depreciation is not needed in their calculation. However, the accounting rate of return cannot be calculated without first deducting depreciation.
- **Answer (D)** is incorrect because The IRR and the payback period are based on cash flows. Depreciation is not needed in their calculation. However, the accounting rate of return cannot be calculated without first deducting depreciation.

Which mutually exclusive project would you select if both are priced at $1,000 and your discount rate is 14%: Project A, with 3 annual cash flows of $1,000, Project B, with 3 years of zero cash flow followed by 3 years of $1,500 annually?

A. Project A.
B. Project B.
C. The IRRs are equal, hence you are indifferent.
D. The NPVs are equal, hence you are indifferent.

- **Answer (A)** is incorrect because Project B has a slightly higher NPV and IRR.
- **Answer (B)** is correct. Project A’s NPV is calculated as follows:

\[
\text{NPV} = 1,000 \times 2.322 - 1,000 = 1,322.00
\]

The second project’s NPV is:

\[
\text{NPV} = 1,500 \times (3.889 - 2.322) - 1,000 = 1,350.50
\]

Since Project B has a slightly higher NPV, it should be selected.
- **Answer (C)** is incorrect because Project B has a slightly higher IRR.
- **Answer (D)** is incorrect because Project B has a slightly higher NPV.
Maloney Company uses a 12% hurdle rate for all capital expenditures and has done the following analysis for four projects for the upcoming year:

<table>
<thead>
<tr>
<th>Project</th>
<th>Initial outlay</th>
<th>Annual net cash inflows:</th>
<th>Net present value</th>
<th>Profitability index</th>
<th>Internal rate of return</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Year 1</td>
<td>Year 2</td>
<td>Year 3</td>
<td>Year 4</td>
</tr>
<tr>
<td>Project 1</td>
<td>$4,960,000</td>
<td>1,600,000</td>
<td>1,900,000</td>
<td>1,300,000</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Project 2</td>
<td>$5,440,000</td>
<td>1,900,000</td>
<td>2,500,000</td>
<td>1,400,000</td>
<td>2,700,000</td>
</tr>
<tr>
<td>Project 3</td>
<td>$4,000,000</td>
<td>1,800,000</td>
<td>1,800,000</td>
<td>1,600,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Project 4</td>
<td>$5,960,000</td>
<td>1,600,000</td>
<td>1,200,000</td>
<td>800,000</td>
<td>1,300,000</td>
</tr>
</tbody>
</table>

Net present value: 281,280, 293,240, (75,960), 85,520
Profitability index: 106%, 105%, 98%, 101%
Internal rate of return: 14%, 15%, 11%, 13%

Which project(s) should Maloney undertake during the upcoming year assuming it has no budget restrictions?

A. All of the projects.
B. Projects 1, 2, and 3.
C. Projects 1, 2, and 4.
D. Projects 1 and 2.

- Answer (A) is incorrect because Project 3 has a negative NPV.
- Answer (B) is incorrect because Project 3 has a negative NPV.
- Answer (C) is correct. A company using the net present value (NPV) method should undertake all projects with positive NPVs that are not mutually exclusive. Given that Projects 1, 2, and 4 have positive NPVs, those projects should be undertaken. Furthermore, a company using the internal rate of return (IRR) as a decision rule ordinarily chooses projects with a return greater than the cost of capital. Given a 12% cost of capital, Projects 1, 2, and 4 should be chosen using an IRR criterion if they are not mutually exclusive. Use of the profitability index yields a similar decision because a project with an index greater than 100% should be undertaken.
- Answer (D) is incorrect because Project 4 has a positive NPV and should be undertaken.

Which projects should Maloney undertake during the upcoming year if it has only $12,000,000 of investment funds available?

A. Projects 1 and 3.
B. Projects 1, 2, and 4.
C. Projects 1 and 4.
D. Projects 1 and 2.

- Answer (A) is incorrect because Project 3 has a negative NPV.
- Answer (B) is incorrect because Choosing three projects violates the $12,000,000 limitation.
- Answer (C) is incorrect because The combined NPV of Projects 1 and 4 is less than the combined NPV of Projects 1 and 2.
Answer (D) is correct. With only $12,000,000 available and each project costing $4,000,000 or more, no more than two projects can be undertaken. Accordingly, projects should be selected because they have the greatest NPVs and profitability indexes.

Which project(s) should Maloney undertake during the upcoming year if it has only $6,000,000 of funds available?

A. Project 3.
B. Projects 1 and 2.
C. Project 1.
D. Project 2.

Answer (A) is incorrect because Project 3 has a negative NPV and should not be selected regardless of the capital available.

Answer (B) is incorrect because selecting two projects violates the $6,000,000 limitation on funds.

Answer (C) is correct. With only $6,000,000 available and each project costing $4,000,000 or more, no more than one project can be undertaken. Project 1 should be chosen because it has a positive NPV and the highest profitability index. The high profitability index means that the company will achieve the highest NPV per dollar of investment with Project 1. The profitability index facilitates comparison of different-sized investments.

Answer (D) is incorrect because Despite having the highest NPV, Project 2 has a lower profitability index than Project 1. Consequently, Project 1 offers the greater return per dollar of investment.

The recommended technique for evaluating projects when capital is rationed and there are no mutually exclusive projects from which to choose is to rank the projects by

A. Accounting rate of return.
B. Payback.
C. Internal rate of return.
D. Profitability index.

Answer (A) is incorrect because The accounting rate of return is a poor technique. It ignores the time value of money.

Answer (B) is incorrect because The payback method ignores the time value of money and long-term profitability.

Answer (C) is incorrect because The internal rate of return is not effective when alternative investments have different lives.

Answer (D) is correct. The profitability index (excess present value index) is often used to decide among investment alternatives when more than one is acceptable. The profitability index of an investment is the ratio of the present value of the future net cash flows (or only cash inflows) to the net initial investment. The profitability index is a variation of the net present value method and facilitates comparison of different-sized investments.

The technique that reflects the time value of money and is calculated by dividing the present value of the future net after-tax cash inflows that have been discounted at the desired cost of capital by the initial cash outlay for the investment is called the

A. Capital rationing method.
B. Average rate of return method.
C. Profitability index method.
D. Accounting rate of return method.
• Answer (A) is incorrect because capital rationing is not a technique but rather a condition that characterizes capital budgeting when insufficient capital is available to finance all profitable investment opportunities.

• Answer (B) is incorrect because the average rate of return method does not divide the future cash flows by the cost of the investment.

• Answer (C) is correct. The profitability index (excess present value index) of an investment is the ratio of the present value of the future net cash flows (or only cash inflows) to the net initial investment. In organizations with unlimited capital funds, this index will produce no conflicts in the decision process. If capital rationing is necessary, the index will be an insufficient determinant. The capital available as well as the dollar amount of the net present value must both be considered.

• Answer (D) is incorrect because the accounting rate of return does not recognize the time value of money.

---

**[Fact Pattern #165]**

Mercken Industries is contemplating four projects, Project P, Project Q, Project R, and Project S. The capital costs and estimated after-tax net cash flows of each independent project are listed below. Mercken’s desired after-tax opportunity cost is 12%, and the company has a capital budget for the year of $450,000. Idle funds cannot be reinvested at greater than 12%.

<table>
<thead>
<tr>
<th>Initial cost</th>
<th>Project P</th>
<th>Project Q</th>
<th>Project R</th>
<th>Project S</th>
</tr>
</thead>
<tbody>
<tr>
<td>$200,000</td>
<td>$235,000</td>
<td>$190,000</td>
<td>$210,000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual cash flows</th>
<th>Project P</th>
<th>Project Q</th>
<th>Project R</th>
<th>Project S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$93,000</td>
<td>$90,000</td>
<td>$45,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>93,000</td>
<td>85,000</td>
<td>55,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>93,000</td>
<td>75,000</td>
<td>65,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Year 4</td>
<td>0</td>
<td>55,000</td>
<td>70,000</td>
<td>65,000</td>
</tr>
<tr>
<td>Year 5</td>
<td>0</td>
<td>50,000</td>
<td>75,000</td>
<td>75,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Net present value</th>
<th>Project P</th>
<th>Project Q</th>
<th>Project R</th>
<th>Project S</th>
</tr>
</thead>
<tbody>
<tr>
<td>$23,370</td>
<td>$29,827</td>
<td>$27,333</td>
<td>($7,854)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Internal rate of return</th>
<th>Project P</th>
<th>Project Q</th>
<th>Project R</th>
<th>Project S</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.7%</td>
<td>17.6%</td>
<td>17.2%</td>
<td>10.6%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Excess present value index</th>
<th>Project P</th>
<th>Project Q</th>
<th>Project R</th>
<th>Project S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.12</td>
<td>1.13</td>
<td>1.14</td>
<td>0.96</td>
<td></td>
</tr>
</tbody>
</table>

---

**[1563] (Refers to Fact Pattern #165)**

During this year, Mercken will choose

A. Projects P, Q, and R.
B. Projects P, Q, R, and S.
C. Projects Q and R.
D. Projects P and Q.

• Answer (A) is incorrect because the amount of capital available limits the company to two projects.

• Answer (B) is incorrect because the amount of capital available limits the company to two projects.

• Answer (C) is correct. Only two of the projects can be selected because three would require more than $450,000 of capital. Project S can immediately be dismissed because it has a negative net present value (NPV). Using the NPV and the profitability index methods, the best investments appear to be Q and R. The internal rate of return (IRR) method indicates that P is preferable to R. However, it assumes reinvestment of funds during Years 4 and 5 at the IRR (18.7%). Given that reinvestment will be at a rate of at most 12%, the IRR decision criterion appears to be unsound in this situation.

• Answer (D) is incorrect because the profitability index and NPV are higher for R than P.
If Mercken is able to accept only one project, the company would choose

A. Project P.
B. Project Q because it has the highest net present value.
C. Project P because it has the highest internal rate of return.
D. Project P because it has the shortest payback period.

- Answer (A) is incorrect because Project P has a life of only 3 years, and the high IRR would be earned only for that period and could not be reinvested at that rate in Years 4 and 5. Also, P’s NPV is lower than that of Q.
- Answer (B) is correct. Because unused funds cannot be invested at a rate greater than 12%, the company should select the investment with the highest net present value. Project Q is preferable to R because its return on the incremental $45,000 invested ($235,000 cost of Q – $190,000 cost of R) is greater than 12%.
- Answer (C) is incorrect because Although P’s IRR of 18.7% for 3 years exceeds Q’s (17.6% for 5 years), the funds from P cannot be invested in Years 4 and 5 at greater than 12%.
- Answer (D) is incorrect because The payback period is a poor means of ranking projects. It ignores both reinvestment rates and the time value of money.

Rohan Transport is considering two alternative buses to transport people between cities that are in the Southeastern U.S., such as Baton Rouge and Gainesville. A gas-powered bus has a cost of $55,000, and will produce end-of-year net cash flows of $22,000 per year for 4 years. A new electric bus will cost $90,000, and will produce cash flows of $28,000 per year for 8 years. The company must provide bus service for 8 years, after which it plans to give up its franchise and to cease operating the route. Inflation is not expected to affect either costs or revenues during the next 8 years. If Rohan Transport’s cost of capital is 16%, by what amount will the better project increase the company’s value?

A. $6,556
B. $(14,432)
C. $13,112
D. $31,632

- Answer (A) is incorrect because It is based on only the first four years for the gas-powered bus.
- Answer (B) is incorrect because It did not discount the purchase price of the second gas-powered bus.
- Answer (C) is incorrect because It is simply a doubling of the NPV for the first four years of the gas-powered bus.
- Answer (D) is correct. The NPV of the electric bus is $31,632, which is greater than that of two gas-powered buses bought 4 years apart. The NPV for the $90,000 electric bus involves multiplying the $28,000 annual cash flows times the present value factor of 4.344, which equals $121,632. Deducting the $90,000 initial cost results in an NPV of $31,632. The NPV for the two gas-powered buses is $10,208, calculated as follows:

\[
\begin{align*}
$22,000 \times 4.344 &= 95,568 \\
\text{Less: first bus} &= (55,000) \\
\text{Less: second bus (55,000 \times .552)} &= (30,360) \\
\text{NPV} &= 10,208
\end{align*}
\]
Mesa Company is considering an investment to open a new banana processing division. The project in question would entail an initial investment of $45,000, and as a result of the project cash inflows of $20,000 can be expected in each of the next 3 years. The hurdle rate is 10%. What is the profitability index for the project?

A. 1.0784
B. 1.1053
C. 1.1379
D. 1.1771

- Answer (A) is incorrect because it uses the wrong present value factors.
- Answer (B) is correct. At a 10% hurdle rate, the present value of the future inflows is $49,740 ($20,000 × 2.487).

Thus, the net present value is $4,740 ($49,740 – $45,000). The profitability index is calculated as follows:

\[
\frac{49,740}{45,000} = 1.1053
\]

- Answer (C) is incorrect because it uses the wrong present value factors.
- Answer (D) is incorrect because it uses the wrong present value factors.

Flex Corporation is studying a capital acquisition proposal in which newly acquired assets will be depreciated using the straight-line method. Which one of the following statements about the proposal would be incorrect if a switch is made to the Modified Accelerated Cost Recovery System (MACRS)?

A. The net present value will increase.
B. The internal rate of return will increase.
C. The payback period will be shortened.
D. The profitability index will decrease.

- Answer (A) is incorrect because the NPV will increase. The present value of the net inflows will increase with no change in the investment.
- Answer (B) is incorrect because the IRR will increase. Deferring expenses to later years increases the discount rate needed to reduce the NPV to $0.
- Answer (C) is incorrect because the payback period will be shortened. Switching to MACRS defers expenses and increases cash flows early in the project’s life.
- Answer (D) is correct. MACRS is an accelerated method of depreciation under which depreciation expense will be greater during the early years of an asset’s life. Thus, the outflows for income taxes will be less in the early years, but greater in the later years, and the NPV (present value of net cash inflows – investment) will be increased. The profitability index (present value of net cash inflows ÷ the investment) must increase if the NPV increases.
Capital Invest, Inc., uses a 12% hurdle rate for all capital expenditures and has done the following analysis for four projects for the upcoming year:

<table>
<thead>
<tr>
<th>Project</th>
<th>Initial Capital Outlay</th>
<th>Annual Net Cash Inflows</th>
<th>Net Present Value</th>
<th>Profitability Index</th>
<th>Internal Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$200,000</td>
<td>$65,000 Year 1, $80,000 Year 2, $80,000 Year 3, $40,000 Year 4</td>
<td>(3,798)</td>
<td>98%</td>
<td>11%</td>
</tr>
<tr>
<td>2</td>
<td>$298,000</td>
<td>$100,000 Year 1, $135,000 Year 2, $90,000 Year 3, $65,000 Year 4</td>
<td>4,276</td>
<td>101%</td>
<td>13%</td>
</tr>
<tr>
<td>3</td>
<td>$248,000</td>
<td>$80,000 Year 1, $95,000 Year 2, $90,000 Year 3, $80,000 Year 4</td>
<td>14,064</td>
<td>106%</td>
<td>14%</td>
</tr>
<tr>
<td>4</td>
<td>$272,000</td>
<td>$95,000 Year 1, $125,000 Year 2, $90,000 Year 3, $60,000 Year 4</td>
<td>14,662</td>
<td>105%</td>
<td>15%</td>
</tr>
</tbody>
</table>

**Which project(s) should Capital Invest undertake during the upcoming year, assuming it has no budget restrictions?**

A. All of the projects.  
B. Projects 1, 2, and 3.  
C. Projects 2, 3, and 4.  
D. Projects 1, 3, and 4.

- Answer (A) is incorrect because Project 1 has a negative NPV and should not be undertaken.  
- Answer (B) is incorrect because Project 1 has a negative NPV and should not be undertaken.  
- Answer (C) is incorrect because a company using the NPV method should undertake all projects with a positive NPV, unless some of those projects are mutually exclusive. Given that Projects 2, 3, and 4 have positive NPVs, they should be undertaken. Project 1 has a negative NPV.  
- Answer (D) is incorrect because Project 1 has a negative NPV and should not be undertaken.  

**Which project(s) should Capital Invest undertake during the upcoming year if it has only $600,000 of funds available?**

A. Projects 1 and 3.  
B. Projects 2, 3, and 4.  
C. Projects 2 and 3.  
D. Projects 3 and 4.

- Answer (A) is incorrect because Project 1 has a negative NPV.  
- Answer (B) is incorrect because this answer violates the $600,000 limitation.  
- Answer (C) is incorrect because the combined NPV of Projects 2 and 3 is less than the combined NPV of Projects 3 and 4.  
- Answer (D) is correct. Given that only $600,000 is available and that each project costs $200,000 or more, no more than two projects can be undertaken. Because Projects 3 and 4 have the greatest NPVs, profitability indexes, and IRRs, they are the projects in which the company should invest.
Which project(s) should Capital Invest undertake during the upcoming year if it has only $300,000 of capital funds available?

A. Project 1.
B. Projects 2, 3, and 4.
C. Projects 3 and 4.
D. Project 3.

- Answer (A) is incorrect because Project 1 has a negative NPV.
- Answer (B) is incorrect because Choosing more than one project violates the $300,000 limitation.
- Answer (C) is incorrect because Choosing more than one project violates the $300,000 limitation.
- Answer (D) is correct. Given that $300,000 is available and that each project costs $200,000 or more, only one project can be undertaken. Because Project 3 has a positive NPV and the highest profitability index, it is the best investment. The high profitability index means that the company will achieve the highest NPV per dollar of investment with Project 3. The profitability index facilitates comparison of different-sized investments.

The technique that measures the estimated performance of a capital investment by dividing the project’s annual after-tax net income by the average investment cost is called the

A. Bail-out payback method.
B. Internal rate of return method.
C. Profitability index method.
D. Accounting rate of return method.

- Answer (A) is incorrect because The bail-out payback method measures the length of the payback period when the periodic cash inflows are combined with the salvage value.
- Answer (B) is incorrect because The internal rate of return method determines the rate at which the NPV is zero.
- Answer (C) is incorrect because The profitability index is the ratio of the present value of future net cash inflows to the initial cash investment.
- Answer (D) is correct. The accounting rate of return (also called the unadjusted rate of return or book value rate of return) measures investment performance by dividing the accounting net income by the average investment in the project. This method ignores the time value of money.
Woods, Inc., is considering four independent investment proposals. Woods has $3 million available for investment during the present period. The investment outlay for each project and its projected net present value (NPV) is presented below.

<table>
<thead>
<tr>
<th>Project</th>
<th>Investment Cost</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>$500,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>II</td>
<td>900,000</td>
<td>120,000</td>
</tr>
<tr>
<td>III</td>
<td>1,200,000</td>
<td>180,000</td>
</tr>
<tr>
<td>IV</td>
<td>1,600,000</td>
<td>150,000</td>
</tr>
</tbody>
</table>

Which of the following project options should be recommended to Woods’ management.

A. Projects I, II, and III only.
B. Projects I, II, and IV only.
C. Projects II, III, and IV only.
D. Projects III and IV only.

Answer (A) is correct. Capital rationing exists when a firm sets a limit on the amount of funds to be invested during a given period. In such situations, a firm cannot afford to undertake all profitable projects. The profitability index (or excess present value index) is a method for ranking projects to ensure that limited resources are placed with the investments that will return the highest net present value (NPV).

\[
\text{Profitability index} = \frac{\text{NPV of future cash flows}}{\text{Net investment}}
\]

The indexes for Woods’ potential projects can thus be calculated as follows:

<table>
<thead>
<tr>
<th>Project</th>
<th>Net Investment Cost</th>
<th>Net Present Value</th>
<th>Profitability Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>$500,000</td>
<td>$40,000</td>
<td>0.080</td>
</tr>
<tr>
<td>II</td>
<td>900,000</td>
<td>120,000</td>
<td>0.133</td>
</tr>
<tr>
<td>III</td>
<td>1,200,000</td>
<td>180,000</td>
<td>0.150</td>
</tr>
<tr>
<td>IV</td>
<td>1,600,000</td>
<td>150,000</td>
<td>0.094</td>
</tr>
</tbody>
</table>

Ranked in order of desirability, they are III, II, IV, and I. Since only $3 million is available for funding, only III, II, and I will be selected.

- Answer (B) is incorrect because Project III is more desirable than Project IV.
- Answer (C) is incorrect because While Project IV is more desirable than Project I, insufficient funding is available to engage Project IV.
- Answer (D) is incorrect because Projects I and II are also desirable and sufficient funding is available.

The technique that incorporates the time value of money by determining the compound interest rate of an investment such that the present value of the after-tax cash inflows over the life of the investment is equal to the initial investment is called the

A. Internal rate of return method.
B. Capital asset pricing model.
C. Profitability index method.
D. Accounting rate of return method.
Answer (A) is correct. The internal rate of return (IRR) is the discount rate at which the present value of the cash inflows equals the present values of the cash outflows (including the original investment). Thus, the NPV of the project is zero at the IRR. The IRR is also the maximum borrowing cost the firm can afford to pay for a specific project. The IRR is similar to the yield rate/effective rate quoted in the business media.

Answer (B) is incorrect because The capital asset pricing model is a means of determining the cost of capital.

Answer (C) is incorrect because The profitability index is not an interest rate.

Answer (D) is incorrect because The accounting rate of return is not based on present values.

The technique that measures the number of years required for the after-tax cash flows to recover the initial investment in a project is called the

A. Net present value method.
B. Payback method.
C. Profitability index method.
D. Accounting rate of return method.

Answer (A) is incorrect because The net present value method first discounts the future cash flows to their present value.

Answer (B) is correct. The usual payback formula divides the initial investment by the constant net annual cash inflow. The payback method is unsophisticated in that it ignores the time value of money, but it is widely used because of its simplicity and emphasis on recovery of the initial investment.

Answer (C) is incorrect because The profitability index method divides the present value of the future net cash inflows by the initial investment.

Answer (D) is incorrect because The accounting rate of return divides the annual net income by the average investment in the project.

Capital budgeting methods are often divided into two classifications: project screening and project ranking. Which one of the following is considered a ranking method rather than a screening method?

A. Net present value.
B. Time-adjusted rate of return.
C. Profitability index.
D. Accounting rate of return.

Answer (A) is incorrect because The net present value (NPV > 0) is a capital budgeting tool that screens investments; i.e., the investment must meet a certain standard to be acceptable.

Answer (B) is incorrect because The time-adjusted rate of return is a capital budgeting tool that screens investments; i.e., the investment must meet a certain standard (rate of return) to be acceptable.

Answer (C) is correct. The profitability index is the ratio of the present value of future net cash inflows to the initial cash investment. This variation of the net present value method facilitates comparison of different-sized investments. Were it not for this comparison feature, the profitability index would be no better than the net present value method. Thus, it is the comparison, or ranking, advantage that makes the profitability index different from the other capital budgeting tools.

Answer (D) is incorrect because The accounting rate of return is a capital budgeting tool that screens investments; i.e., the investment must meet a certain standard (rate of return) to be acceptable.
Molar, Inc., is evaluating three independent projects for the expansion of different product lines. The Finance Department has performed an extensive analysis of each project, and the chief financial officer has indicated that there is no capital rationing in effect. Which of the following statements are correct?

I. Reject any project with a payback period that is shorter than the company standard.
II. The project with the highest internal rate of return (IRR) exceeding the hurdle rate should be selected and the others rejected.
III. All projects with positive net present values should be selected.
IV. Molar should reject any projects with negative IRRs.

A. I, II, and IV only.
B. I, II, III, and IV.
C. II and III only.
D. III and IV only.

- Answer (A) is incorrect because A firm that uses the payback period method would accept projects with payback periods shorter than the standard.
- Answer (B) is incorrect because As long as there is no capital rationing constraint, all projects with net present values exceeding the hurdle rate should be selected.
- Answer (C) is incorrect because As long as there is no capital rationing constraint, all projects with net present values exceeding the hurdle rate should be selected.
- Answer (D) is correct. As long as there is no capital rationing constraint, all projects with net present values exceeding the hurdle rate should be selected. Also, rejecting projects with negative internal rates of return is a sound investment guideline. Companies prefer projects with shorter payback periods.

Ironside Products is considering two independent projects, each requiring a cash outlay of $500,000 and having an expected life of 10 years. The forecasted annual net cash inflows for each project and the probability distributions for these cash inflows are as follows:

<table>
<thead>
<tr>
<th>Probabilities</th>
<th>Cash Inflows</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10</td>
<td>$ 75,000</td>
</tr>
<tr>
<td>0.80</td>
<td>$ 95,000</td>
</tr>
<tr>
<td>0.10</td>
<td>$115,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probabilities</th>
<th>Cash Inflows</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>$ 70,000</td>
</tr>
<tr>
<td>0.50</td>
<td>$110,000</td>
</tr>
<tr>
<td>0.25</td>
<td>$150,000</td>
</tr>
</tbody>
</table>

Ironside has decided that the project with the greatest relative risk should meet a hurdle rate of 16% and the project with less risk should meet a hurdle rate of 12%. Given these parameters, which of the following actions should be recommended for Ironside to undertake.

A. Reject both projects.
B. Accept Project R and reject Project S.
C. Reject Project R and accept Project S.
D. Accept both projects.

- Answer (A) is incorrect because Both projects, discounted at the appropriate hurdle rates, have positive net present values.
- Answer (B) is incorrect because Project S should be accepted also.
- Answer (C) is incorrect because Project R should be accepted also.
Answer (D) is correct. The probable annual cash inflows for the two projects can be calculated as follows:

<table>
<thead>
<tr>
<th>Cash Inflow</th>
<th>Probability</th>
<th>Probable Cash Inflow</th>
<th>Cash Probable Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>$75,000</td>
<td>10%</td>
<td>$7,500</td>
<td>Project R</td>
</tr>
<tr>
<td>95,000</td>
<td>80%</td>
<td>76,000</td>
<td></td>
</tr>
<tr>
<td>115,000</td>
<td>10%</td>
<td>11,500</td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td>$95,000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cash Inflow</th>
<th>Probability</th>
<th>Probable Cash Inflow</th>
<th>Cash Probable Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>$70,000</td>
<td>25%</td>
<td>$17,500</td>
<td>Project S</td>
</tr>
<tr>
<td>110,000</td>
<td>50%</td>
<td>55,000</td>
<td></td>
</tr>
<tr>
<td>150,000</td>
<td>25%</td>
<td>37,500</td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td>$110,000</td>
<td></td>
</tr>
</tbody>
</table>

Project R is less risky as the anticipated cash flows are more certain, both in probability and in spread; whereas Project S has a wide range of possible cash flows, and it is less certain that a profitable level of cash flow will be achieved. Therefore, Project R should be discounted at 12% and Project S at 16%. Discounting the cash flows from Project R (ordinary annuity of $95,000 for 10 years) at 12% and discounting the cash flows from Project S (ordinary annuity of $110,000 for 10 years) at 16% yields results of $536,771 and $531,655, respectively. Since both projects exceed the present value of the total cash outflows ($500,000), they should both be accepted.

[Fact Pattern #167]
Hobart Corporation evaluates capital projects using a variety of performance screens, including a hurdle rate of 16%, payback period of 3 years or less, and an accounting rate of return of 20% or more.

[1578] (Refers to Fact Pattern #167)
Hobart’s management is completing review of a project on the basis of the following projections:

- Capital investment: $200,000
- Annual cash flows: $65,000
- Straight-line depreciation: 8 years
- Terminal value: $20,000

The projected net present value is negative $2,000. Which one of the following alternatives reflects the appropriate conclusions for the indicated evaluative measures.

<table>
<thead>
<tr>
<th>Net Present Value</th>
<th>Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Accept</td>
<td>Reject</td>
</tr>
<tr>
<td>B. Reject</td>
<td>Accept</td>
</tr>
<tr>
<td>C. Accept</td>
<td>Accept</td>
</tr>
<tr>
<td>D. Reject</td>
<td>Reject</td>
</tr>
</tbody>
</table>

- Answer (A) is incorrect because The appropriate decision under the net present value method is also to reject.
- Answer (B) is incorrect because The appropriate decision under the payback method is also to reject.
- Answer (C) is incorrect because The appropriate decision under both methods is to reject the project.
- Answer (D) is correct. A capital project is acceptable if the net present value of its cash flows is greater than zero. Since the net present value of this project is negative, the appropriate decision is to reject it. Under the payback method, the undiscounted cash inflows must exceed the undiscounted cash outflows within a specified period. Since it takes more than 3 years for the inflows from this project ($65,000 × 3 = $195,000) to exceed the outflows ($200,000), the appropriate decision under this method is also to reject.
Staten Corporation is considering two mutually exclusive projects. Both require an initial outlay of $150,000 and will operate for 5 years. The cash flows associated with these projects are as follows.

<table>
<thead>
<tr>
<th>Year</th>
<th>Project X</th>
<th>Project Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$ 47,000</td>
<td>$ 0</td>
</tr>
<tr>
<td>2</td>
<td>47,000</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>47,000</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>47,000</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>47,000</td>
<td>280,000</td>
</tr>
<tr>
<td>Total</td>
<td>$235,000</td>
<td>$280,000</td>
</tr>
</tbody>
</table>

Staten’s required rate of return is 10%. Using the net present value method, which one of the following actions would you recommend to Staten?

A. Accept Project Y and reject Project X.
B. Accept Projects X and Y.
C. Accept Project X and reject Project Y.
D. Reject Projects X and Y.

- Answer (A) is incorrect because the net present value of Project X is greater than that of Project Y.
- Answer (B) is incorrect because the projects are mutually exclusive.
- Answer (C) is **correct**. When capital projects are mutually exclusive, the one with the highest net present value should be selected.

\[
\begin{align*}
\text{Cash inflows} & \quad \text{Project X} \quad \text{Project Y} \\
\text{Times: PV factor for an ordinary annuity at 10\% for 5 years} & \quad \times 3.791\% \quad \times 0.621\% \\
\text{PV of cash inflows} & \quad $178,177 \quad $173,880 \\
\text{Less: net initial investment} & \quad (150,000) \quad (150,000) \\
\text{Net present value} & \quad $28,177 \quad $23,880 \\
\end{align*}
\]

Project X should be accepted ($28,177 > $23,880).
- Answer (D) is incorrect because the net present value of both projects is positive, so neither can be immediately rejected.
Foggy Products is evaluating two mutually exclusive projects, one requiring a $4 million initial outlay and the other a $6 million outlay. The Finance Department has performed an extensive analysis of each project. The chief financial officer has indicated that there is no capital rationing in effect. Which of the following statements are correct?

I. Both projects should be rejected if their payback periods are longer than the company standard.
II. The project with the highest internal rate of return (IRR) should be selected (assuming both IRRs exceed the hurdle rate).
III. The project with the highest positive net present value should be selected.
IV. Select the project with the smaller initial investment, regardless of which evaluation method is used.

A. I, II, and IV only.
B. I, II, and III only.
C. I and III only.
D. II and III only.

- Answer (A) is incorrect because The size of the initial investment considered in isolation is not a sound criterion for evaluating capital projects.
- Answer (B) is incorrect because The lower priced project may have a higher IRR but produce less cash flow than the higher cost project.
- Answer (C) is correct. If the firm uses a payback period criterion, both projects should be rejected if their payback periods are longer than the company standard. Since the projects are mutually exclusive, only one can be selected. Selecting the project with the higher net present value is consistent with higher profitability.
- Answer (D) is incorrect because The lower priced project may have a higher IRR but produce less cash flow than the higher cost project.

Winston Corporation is subject to a 30% effective income tax rate and uses the net present value method to evaluate capital budgeting proposals. Harry Ralston, the capital budget manager, desires to improve the appeal of a marginally attractive proposal. To accomplish his goal, which one of the following actions should be recommended to Ralston?

A. Postpone a fully deductible major overhaul from Year 4 to Year 5.
B. Decrease the project’s estimated terminal salvage value.
C. Immediately pay the proposal’s marketing program in its entirety rather than pay in five equal installments.
D. Adjust the project’s discount rate to reflect movement of the project from a low risk category to an average risk category.

- Answer (A) is correct. Delaying cash outflows increases a project’s net present value, making it more attractive.
- Answer (B) is incorrect because Decreasing the terminal salvage value will make the project less attractive.
- Answer (C) is incorrect because Speeding up cash outflows will make the project less attractive.
- Answer (D) is incorrect because Reclassifying a project as average risk from low risk will increase the project’s hurdle rate, making it less attractive.
Diane Harper, Vice President of Finance for BGN Industries, is reviewing material prepared by her staff prior to the board of directors meeting at which she must recommend one of four mutually exclusive options for a new product line. The summary information below indicates the initial investment required, the present value of cash inflows (excluding the initial investment) at BGN’s hurdle rate of 16%, and the internal rate of return (IRR) for each of the four options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Investment</th>
<th>Present Value of Cash Inflows at 16%</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>$3,950,000</td>
<td>$3,800,000</td>
<td>15.5%</td>
</tr>
<tr>
<td>Y</td>
<td>$3,000,000</td>
<td>$3,750,000</td>
<td>19.0%</td>
</tr>
<tr>
<td>Z</td>
<td>$2,000,000</td>
<td>$2,825,000</td>
<td>17.25%</td>
</tr>
<tr>
<td>W</td>
<td>$800,000</td>
<td>$1,100,000</td>
<td>18.0%</td>
</tr>
</tbody>
</table>

If there are no capital rationing constraints, which option should Harper recommend?

A. Option X.  
B. Option Y.  
C. Option Z.  
D. Option W.

- Answer (A) is incorrect because Option X has a negative net present value.  
- Answer (B) is incorrect because the net present value of Option Y is only $750,000.  
- Answer (C) is correct. The net present value of Option Z is $825,000 ($2,825,000 – $2,000,000), the highest of the four options.  
- Answer (D) is incorrect because Option W only has the lowest initial investment; in the absence of capital rationing, it does not make the most attractive option.

Wearwell Company is considering three investment projects. Wearwell’s president asked the controller to prepare a report and recommend an appropriate investment decision. The results of the controller’s calculations for the three projects are as follows:

<table>
<thead>
<tr>
<th>Project</th>
<th>Net Present Value</th>
<th>Internal Rate of Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$20,680</td>
<td>12%</td>
</tr>
<tr>
<td>B</td>
<td>30,300</td>
<td>10%</td>
</tr>
<tr>
<td>C</td>
<td>15,000</td>
<td>13%</td>
</tr>
</tbody>
</table>

The company expects a minimum net present value (NPV) of $20,000 from accepted projects. The projects are mutually exclusive, and Wearwell’s cost of capital is 8%. Which one of the following options should the controller recommend to the president.

A. Project C because it has the highest internal rate of return (IRR).  
B. Project B because it has the highest net present value (NPV).  
C. Projects A, B, and C because each of the projects has an IRR greater than the cost of capital.  
D. Projects A and B because they exceed the minimum expected NPV.

- Answer (A) is incorrect because Internal rate of return is not the soundest basis on which to make investment decisions when initial investments vary among alternatives.  
- Answer (B) is correct. Net present value is the soundest basis on which to make investment decisions.  
- Answer (C) is incorrect because The projects are mutually exclusive.
Answer (D) is incorrect because the projects are mutually exclusive.

Which one of the following capital budgeting techniques would result in the same project selection as the net present value method.

A. Discounted payback.
B. Internal rate of return.
C. Profitability index.
D. Accounting rate of return.

Answer (A) is incorrect because discounted payback will not necessarily yield the same decision as net present value.
Answer (B) is incorrect because the internal rate of return will not necessarily yield the same decision as net present value.
Answer (C) is correct. The net present value of a capital project is derived by subtracting the discounted cash outflows from the discounted cash inflows. The profitability index is the ratio of the same two numbers (inflows to outflows). Thus, they will yield the same decision (if the net present value is positive, the profitability index will be > 1).
Answer (D) is incorrect because the accounting rate of return will not necessarily yield the same decision as net present value.

Lewis Services is evaluating six investment opportunities (projects). The following table reflects each project’s net present value (NPV) and the respective initial investments required. All of these projects are independent.

<table>
<thead>
<tr>
<th>Project</th>
<th>NPV</th>
<th>Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>$ 5,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>S</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>T</td>
<td>8,000</td>
<td>40,000</td>
</tr>
<tr>
<td>U</td>
<td>15,000</td>
<td>60,000</td>
</tr>
<tr>
<td>V</td>
<td>15,000</td>
<td>75,000</td>
</tr>
<tr>
<td>W</td>
<td>3,000</td>
<td>15,000</td>
</tr>
</tbody>
</table>

Lewis has an investment constraint of $100,000. Which combination of projects would represent the optimal investment that should be recommended to Lewis Services’ management.

A. R, S, U, and W.
B. R, V, and W.
C. R, S, and V.
D. T and U.
Answer (A) is correct. The profitability index is an efficient means for ranking capital projects. It is the ratio of the net present value of a project’s cash flows to the net investment. The indexes for these projects can be calculated as follows:

<table>
<thead>
<tr>
<th>Project</th>
<th>NPV</th>
<th>Investment</th>
<th>Profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>$5,000</td>
<td>$10,000</td>
<td>0.50</td>
</tr>
<tr>
<td>S</td>
<td>5,000</td>
<td>5,000</td>
<td>1.00</td>
</tr>
<tr>
<td>T</td>
<td>8,000</td>
<td>40,000</td>
<td>0.20</td>
</tr>
<tr>
<td>U</td>
<td>15,000</td>
<td>60,000</td>
<td>0.25</td>
</tr>
<tr>
<td>V</td>
<td>15,000</td>
<td>75,000</td>
<td>0.20</td>
</tr>
<tr>
<td>W</td>
<td>3,000</td>
<td>15,000</td>
<td>0.20</td>
</tr>
</tbody>
</table>

They can now be ranked in order of desirability, and those projects fitting within the $100,000 capital constraint can be selected. The projects with the three highest profitability indexes, S, R, and U, can all be undertaken ($5,000 + $10,000 + $60,000 = $75,000). One more project from among the others can be undertaken if its initial investment is less than $25,000 ($100,000 – $75,000). Project W fits this criterion.

Answer (B) is incorrect because The combination of Projects R, V, and W is not the most profitable use of the $100,000 investment constraint.

Answer (C) is incorrect because The combination of Projects R, S, and W is not the most profitable use of the $100,000 investment constraint.

Answer (D) is incorrect because The combination of Projects T and U is not the most profitable use of the $100,000 investment constraint.

Zinx Corporation has a maximum of $5,000,000 available for investments. The company has identified the following investment options:

<table>
<thead>
<tr>
<th>Project</th>
<th>Investment</th>
<th>Discounted Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>$2,800,000</td>
<td>$3,360,000</td>
</tr>
<tr>
<td>II</td>
<td>1,500,000</td>
<td>1,720,000</td>
</tr>
<tr>
<td>III</td>
<td>2,300,000</td>
<td>2,617,000</td>
</tr>
<tr>
<td>IV</td>
<td>1,200,000</td>
<td>1,368,000</td>
</tr>
<tr>
<td>V</td>
<td>800,000</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

Which of the following project alternatives should be recommended to Zinx’s management.

A. II, III, and IV.
B. II, III, and V.
C. I and II.
D. I, IV, and V.

Answer (A) is incorrect because The combination of Projects II, III, and IV is not the most profitable use of the $5,000,000 investment constraint.

Answer (B) is incorrect because The combination of Projects II, III, and V is not the most profitable use of the $5,000,000 investment constraint.

Answer (C) is incorrect because The combination of Projects I and II is not the most profitable use of the $5,000,000 investment constraint.
Answer (D) is correct. The profitability index is an efficient means for ranking capital projects. It is the ratio of the net present value of a project’s cash flows to the net investment. The indexes for these projects can be calculated as follows:

<table>
<thead>
<tr>
<th>Project</th>
<th>Initial NPV</th>
<th>Initial Investment</th>
<th>Profitability Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>$3,360,000</td>
<td>$2,800,000</td>
<td>1.20</td>
</tr>
<tr>
<td>II</td>
<td>1,720,000</td>
<td>1,500,000</td>
<td>1.15</td>
</tr>
<tr>
<td>III</td>
<td>2,617,000</td>
<td>2,300,000</td>
<td>1.14</td>
</tr>
<tr>
<td>IV</td>
<td>1,368,000</td>
<td>1,200,000</td>
<td>1.14</td>
</tr>
<tr>
<td>V</td>
<td>1,000,000</td>
<td>800,000</td>
<td>1.25</td>
</tr>
</tbody>
</table>

They can now be ranked in order of desirability, and those projects fitting within the $5,000,000 capital constraint can be selected. The projects with the two highest profitability indexes, V and I, can both be undertaken ($800,000 + $2,800,000 = $3,600,000). One more project from among the others can be undertaken if its initial investment is less than $1,400,000 ($5,000,000 – $3,600,000). Project IV fits this criterion.

In evaluating independent capital investment projects, the best reason for a firm to accept such projects is a(n.

A. Accounting rate of return greater than zero.
B. Initial investment greater than the present value of cash inflows.
C. Profitability index greater than one.
D. Internal rate of return greater than the accounting rate of return.

- Answer (A) is incorrect because Accounting rate of return is a poor method for evaluating capital projects.
- Answer (B) is incorrect because To be acceptable, the initial investment should be less than the present value of the cash inflows.
- Answer (C) is correct. The profitability index is an efficient means for ranking capital projects. It is the ratio of the net present value of a project’s cash flows to the net investment. Any project with a profitability index > 1 is expected to be profitable.
- Answer (D) is incorrect because Any comparison with the accounting rate of return is a poor basis for evaluating capital projects.

Carbide, Inc., has the following investment opportunities. Required investment outlays and the profitability index for each of these investments are as follows:

<table>
<thead>
<tr>
<th>Project</th>
<th>Investment Cost</th>
<th>Profitability Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>$300,000</td>
<td>0.5</td>
</tr>
<tr>
<td>II</td>
<td>450,000</td>
<td>1.4</td>
</tr>
<tr>
<td>III</td>
<td>650,000</td>
<td>1.8</td>
</tr>
<tr>
<td>IV</td>
<td>750,000</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Carbide’s budget ceiling for initial outlays during the present period is $1,500,000. The proposed projects are independent of each other. Which project or projects would you recommend that Carbide accept.

A. III.
B. III and IV.
C. I, II, and IV.
D. I, III, and IV.
Answer (A) is incorrect because Project IV can also be undertaken within the $1,500,000 capital constraint.

Answer (B) is correct. The profitability index is an efficient means for ranking capital projects. It is the ratio of the net present value of a project’s cash flows to the net investment. Any project with a profitability index > 1 is expected to be profitable. Projects III and IV, the projects with the two highest indexes, fit within the $1,500,000 capital constraint.

Answer (C) is incorrect because including Project I, with a profitability index of < 1, is not the best use of the $1,500,000 capital constraint.

Answer (D) is incorrect because including Project I, with a profitability index of < 1, is not the best use of the $1,500,000 capital constraint.

Dobson Corp. is analyzing a capital investment requiring a cash outflow at time = 0 of $2.5 million and net cash inflows of $800,000 per year for 5 years. The net present value (NPV) was calculated to be $384,000 at a 12% discount rate. Since several managers felt this was a risky project, three separate scenarios were analyzed, as follows:

Scenario R - The annual cash inflows were reduced by 10%.
Scenario S - The discount rate was changed to 18%.
Scenario T - The cash inflow in Year 5 was reduced to zero.

Rank the three individual scenarios in the order of the effect on NPV, from least effect to greatest effect.

A. R, S, T.
B. R, T, S.
C. S, T, R.
D. T, S, R.

Answer (A) is incorrect. The initial calculation would have been $800,000 times the 12% annuity factor of 3.605, or $2,884,000. Deducting the $2,500,000 cost produced the initial NPV of $384,000. The calculation under Scenario R would involve reducing the annual inflows by 10% to $720,000. Multiplying $720,000 times 3.605 produces a present value of $2,595,600. Scenario S would discount the $800,000 of annual inflows using the 18% annuity factor of 3.127, resulting in a present value of $2,501,600. Scenario T would involve discounting the $800,000 for only 4 years, using the 12% factor of 3.037, which results in a present value of $2,429,600. Thus, Scenario R (present value of $2,595,600) has the least effect, followed by Scenario S ($2,501,600), and then Scenario T ($2,429,600).

Answer (B) is incorrect because Scenario T has a greater effect than Scenario S.

Answer (C) is incorrect because both Scenario S and Scenario T have a greater effect than Scenario R.

Answer (D) is incorrect because this is in the reverse order of effect in that Scenario T has the greatest.

Monroe Company needs an additional machine that will be used for the next 5 years, at which time the machine will be obsolete and have zero salvage value. Monroe has two options available: purchase the asset for the list price of $300,000 cash or lease the asset, requiring five annual lease payments of $68,000 with the first payment due immediately. The lease payments include 6% interest. Excluding depreciation considerations, the best alternative is to

A. Purchase the asset for a $40,000 advantage.
B. Purchase the asset for a $3,627 advantage.
C. Lease the asset for a $45,918 advantage.
D. Lease the asset for a $13,557 advantage.

Answer (A) is incorrect because this option does not take into consideration the time value of money. This option incorrectly multiplies the annual lease payments by 5 to get a total lease cost of $340,000 ($68,000 × 5).
Answer (B) is correct. In order to compare the cost of the two alternatives, the PV factors of the lease option must be considered. The PV factor of an annuity due (the first payment is due immediately) at a 6% interest rate with \( n \) equal to 5 years is 4.46511. Thus, the cost of the lease option is $303,627 ($68,000 \times 4.46511). Purchasing the asset would be more advantageous by $3,627 ($303,627 cost to lease – $300,000 cost to purchase).

Answer (C) is incorrect because Purchasing the asset, not leasing the asset, is the best alternative. The cost to lease the asset is $303,627 ($68,000 \times 4.46511), which is $3,627 more than the cost to purchase the asset for $300,000.

Answer (D) is incorrect because this option incorrectly uses the PV factors for an ordinary annuity. The first lease payment is due immediately, so this lease qualifies as an annuity due, not an ordinary annuity. The PV factor of an annuity due at a 6% interest rate with \( n \) equal to 5 years is 4.46511.

If a project has a profitability index that is greater than 1.0, it means that the

A. Initial investment exceeds the cash flows.
B. Cash flows exceed the initial investment.
C. Required return is less than the internal rate of return.
D. Internal rate of return is equal to the required return.

Answer (A) is incorrect because the profitability index can be calculated by dividing the PV of future cash flows by the net investment. In order for this to be greater than 1, the initial investment must be less than the PV of the cash flows, not greater than the cash flows.

Answer (B) is incorrect because the profitability index can be calculated by dividing the PV of future cash flows by the net investment. In order for this to be greater than 1, the PV of the cash flows must exceed the initial net investment. This question simply states that the cash flows must exceed the initial investment, which does not take into consideration the PV factors.

Answer (C) is correct. The profitability index can be calculated by dividing the PV of future cash flows by the net investment. In order for this to be greater than 1, the required return must be less than the internal rate of return. If the required rate of return is less than the internal rate of return, this means that the project will be profitable for the company because the return on the project is higher than the company’s required rate.

Answer (D) is incorrect because the profitability index can be calculated by dividing the PV of future cash flows by the net investment. In order for this to be greater than 1, the internal rate of return does not have to be equal to the required rate of return.

Large firms often seek to control risk through allocating or rationing capital among divisions. When capital is rationed, managers are most likely to choose among prospective investments based on their

A. Net present value (NPV) rankings.
B. Internal rate of return (IRR) rankings.
C. Payback periods.
D. Profitability index rankings.

Answer (A) is incorrect because managers will most likely not choose their investments based solely on the NPV of the projects when capital is rationed. This method does not take into consideration the limited resources available. The net initial investment is also a factor that must be considered when selecting among prospective projects.

Answer (B) is incorrect because managers will most likely not choose their investments based solely on the IRR of the project when capital is rationed. The internal rate of return expresses a project’s return in percentage terms. The IRR of an investment is the discount rate at which the investment’s NPV equals zero. This method does not take into consideration the fact that resources may be limited.
Answer (C) is incorrect because Managers will most likely not choose their investments based solely on the payback periods of the project when capital is rationed. The payback period is the number of years required to return the original investment, that is, the time necessary for a new asset to pay for itself. Note that no consideration is made for the time value of money under this method. In addition, this method does not take into consideration the fact that resources may be limited.

Answer (D) is correct. The profitability index is a method for ranking projects to ensure that limited resources are placed with the investments that will return the highest NPV. This can be calculated by dividing the NPV of the the future cash flows by the net investment.

Using the profitability index, which one of the following projects is the best investment?

<table>
<thead>
<tr>
<th>Initial investment</th>
<th>Project A</th>
<th>Project B</th>
<th>Project C</th>
<th>Project D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net present value</td>
<td>$10,000,000</td>
<td>$7,000,000</td>
<td>$5,000,000</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Internal rate of return</td>
<td>11%</td>
<td>12%</td>
<td>8%</td>
<td>10%</td>
</tr>
</tbody>
</table>

A. Project A.  
B. Project B.  
C. Project C.  
D. Project D.

Answer (A) is incorrect because The profitability index can be calculated by dividing the NPV of the project by the net initial investment. The profitability index for Project A can be calculated as follows: .11 ($1,100,000 ÷ $10,000,000). Project A’s profitability index is not the best because it is not the greatest one.

Answer (B) is incorrect because The profitability index for Project B can be calculated by dividing the NPV of the project by the net initial investment. The profitability index can be calculated as follows: .10 ($700,000 ÷ $7,000,000). Project B’s profitability index is not the best because it is not the greatest one.

Answer (C) is incorrect because The profitability index for Project C can be calculated by dividing the NPV of the project by the net initial investment. The profitability index can be calculated as follows: .06 ($300,000 ÷ $5,000,000). Project C’s profitability index is not the best because it is not the greatest one.

Answer (D) is correct. The profitability index can be calculated by dividing the NPV of the project by the net initial investment. The profitability index for each project can be calculated as follows: Project A = .11 ($1,100,000 ÷ $10,000,000), Project B = .10 ($700,000 ÷ $7,000,000), Project C = .06 ($300,000 ÷ $5,000,000), and Project D = .125 ($250,000 ÷ $2,000,000). The highest profitability index is .125, which belongs to Project D, making it the best investment.
McLean, Inc., is considering the purchase of a new machine that will cost $150,000. The machine has an estimated useful life of 3 years. Assume that 30% of the depreciable base will be depreciated in the first year, 40% in the second year, and 30% in the third year. The new machine will have a $10,000 resale value at the end of its estimated useful life. The machine is expected to save the company $85,000 per year in operating expenses. McLean uses a 40% estimated income tax rate and a 16% hurdle rate to evaluate capital projects.

Discount rates for a 16% rate are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Present Value of $1</th>
<th>Present Value of an Ordinary Annuity of $1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>.862</td>
<td>.862</td>
</tr>
<tr>
<td>Year 2</td>
<td>.743</td>
<td>1.605</td>
</tr>
<tr>
<td>Year 3</td>
<td>.641</td>
<td>2.246</td>
</tr>
</tbody>
</table>

What is the net present value of this project?

A. $15,842  
B. $13,278  
C. $40,910  
D. $9,432

- Answer (A) is incorrect because Ignoring tax on the cash proceeds received from salvage value results in an NPV of $15,842.
- Answer (B) is correct. The NPV method discounts the expected cash flows from a project using the required rate of return. A project is acceptable if its NPV is positive. The future cash inflows consist of $85,000 of saved expenses per year minus income taxes after deducting depreciation. In the first year, the after-tax cash inflow is $85,000 minus taxes of $16,000 \( \left( \frac{85,000 - (150,000 \times 30\%)}{40\%} \right) \times 40\% \), or $69,000. In the second year, the after-tax cash inflow is $85,000 minus taxes of $10,000 \( \left( \frac{85,000 - (150,000 \times 40\%)}{40\%} \right) \times 40\% \), or $75,000. In the third year, the after-tax cash inflow (excluding salvage value) is again $69,000. Also in the third year, the after-tax cash inflow from the salvage value is $6,000 \( \left( \frac{10,000 \times (1 - 40\%)}{40\%} \right) \). Accordingly, the total for the third year is $75,000 ($69,000 + $6,000). The sum of these cash flows discounted using the factors for the present value of $1 at a rate of 16% is calculated as follows:

\[
\begin{align*}
69,000 \times .862 &= 59,478 \\
75,000 \times .743 &= 55,725 \\
75,000 \times .641 &= 48,075 \\
\text{Discounted cash inflows} &= \$163,278
\end{align*}
\]

Thus, the NPV is $13,278 ($163,278 – $150,000 initial outflow).
- Answer (C) is incorrect because The amount of $40,910 equals the present value of a 3-year annuity of $85,000 discounted at 16%, minus $150,000.
- Answer (D) is incorrect because Failing to include the cash proceeds from salvage value results in an NPV of $9,432.
The payback period for this investment would be:

A. 2.94 years.
B. 1.76 years.
C. 2.09 years.
D. 1.14 years.

- Answer (A) is incorrect because this number of years does not consider depreciation.
- Answer (B) is incorrect because this number of years ignores the tax effects.
- Answer (C) is correct. The payback period is the number of years required for the cumulative undiscounted net cash inflows to equal the original investment. The future net cash inflows consist of $69,000 in Years 1 and 3, and $75,000 in Year 2. After 2 years, the cumulative undiscounted net cash inflow equals $144,000. Thus, $6,000 ($150,000 − $144,000) is to be recovered in Year 3, and payback should be complete in approximately 2.09 years [2 years + ($6,000 ÷ $69,000 net cash inflow in third year)].
- Answer (D) is incorrect because this number of years results from considering the depreciation as a cash inflow and failing to account for the income tax.

MS Trucking is considering the purchase of a new piece of equipment that has a net initial investment with a present value of $300,000. The equipment has an estimated useful life of 3 years. For tax purposes, the equipment will be fully depreciated at rates of 30%, 40%, and 30% in Years 1, 2, and 3, respectively. The new machine is expected to have a $20,000 salvage value. The machine is expected to save the company $170,000 per year in operating expenses. MS Trucking has a 40% marginal income tax rate and a 16% cost of capital. Discount rates for a 16% rate are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Present Value of an Ordinary Annuity of $1</th>
<th>Present Value of $1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>.862</td>
<td>.862</td>
</tr>
<tr>
<td>Year 2</td>
<td>1.605</td>
<td>.743</td>
</tr>
<tr>
<td>Year 3</td>
<td>2.246</td>
<td>.641</td>
</tr>
</tbody>
</table>

What is the net present value of this project?

A. $81,820
B. $26,556
C. $118,956
D. $138,000

- Answer (A) is incorrect because the amount of $81,820 results from multiplying $170,000 by 2.246 and then subtracting $300,000.
Answer (B) is correct. The NPV method discounts the expected cash flows from a project using the required rate of return. A project is acceptable if its NPV is positive. The future cash inflows consist of $170,000 of saved expenses per year minus income taxes after deducting depreciation. In the first year, the after-tax cash inflow is $170,000 minus taxes of $32,000 \([\$170,000 - (\$300,000 \times 30\%) \text{ depreciation}] \times 40\%), or $138,000. In the second year, the after-tax cash inflow is $170,000 minus taxes of $20,000 \([\$170,000 - (\$300,000 \times 40\%) \text{ depreciation}] \times 40\%), or $150,000. In the third year, the after-tax cash inflow is again $138,000. Also in the third year, the after-tax cash inflow from the salvage value is $12,000 \([\$20,000 \times (1 - 40\%)]\). Accordingly, the sum of these cash flows discounted using the factors for the present value of $1 at a rate of 16\% is $326,556.

\[
\begin{align*}
$138,000 \times .862 &= $118,956 \\
$150,000 \times .743 &= 111,450 \\
$150,000 \times .641 &= 96,150
\end{align*}
\]

Discounted cash inflows $326,556

Thus, the NPV is $26,556 (\$326,556 - \$300,000 initial outflow).

Answer (C) is incorrect because The amount of $118,956 is the present value of Year 1 cash inflows.

Answer (D) is incorrect because The amount of $138,000 is the sum of the undiscounted cash flows minus $300,000.

What is the profitability index for the project?

A. 1.089  
B. 0.789  
C. 1.315  
D. 1.059

Answer (A) is correct. The profitability index is the present value of the future net cash inflows divided by the present value of the net initial investment. The present value of the future net cash inflows is $326,556. The future cash inflows consist of $170,000 of saved expenses per year minus income taxes after deducting depreciation. In the first year, the after-tax cash inflow is $170,000 minus taxes of $32,000 \([\$170,000 - (\$300,000 \times 30\%) \text{ depreciation}] \times 40\%), or $138,000. In the second year, the after-tax cash inflow is $170,000 minus taxes of $20,000 \([\$170,000 - (\$300,000 \times 40\%) \text{ depreciation}] \times 40\%), or $150,000. In the third year, the after-tax cash inflow is again $138,000. Also in the third year, the after-tax cash inflow from the salvage value is $12,000 \([\$20,000 \times (1 - 40\%)]\). Accordingly, the sum of these cash flows discounted using the factors for the present value of $1 at a rate of 16\% is $326,556. Year 1: $138,000 \times .862 = $118,956. Year 2: $150,000 \times .743 = $111,450. Year 3: $150,000 \times .641 = $96,150. Discounted cash inflows = $118,956 + 111,450 + 96,150 = $326,556. Hence, the profitability index is 1.089 ($326,556 ÷ $300,000).

NOTE: On the CMA exam, the numerator of the profitability index may be based on (1) all cash flows or (2) only the future net cash inflows (excluding the initial investment). The second option is used in this question.

Answer (B) is incorrect because The amount of 0.789 does not consider the income tax savings from depreciation.

Answer (C) is incorrect because The amount of 1.315 ignores all cash flows for income taxes.

Answer (D) is incorrect because The amount of 1.059 uses a 30\% depreciation rate for each year.
The payback period for this investment is 2.09 years.

- Answer (A) is incorrect because the amount of 2.08 years includes salvage value in the Year 3 cash flow.
- Answer (B) is incorrect because the amount of 2.79 years improperly discounts the cash flows.
- Answer (C) is correct. The payback period is the time required to recover the original investment. The annual net after-tax cash inflows for Year 1 through Year 3 are $138,000, $150,000, and $150,000, respectively, as determined by the following: In Year 1, the after-tax cash inflow is $170,000 minus taxes of $32,000 ([$170,000 – ($300,000 × 30%) depreciation] × 40%), or $138,000. In Year 2, the after-tax cash inflow is $170,000 minus taxes of $20,000 ([$170,000 – ($300,000 × 40%) depreciation] × 40%), or $150,000. In Year 3, the after-tax cash inflow is again $138,000. After 2 years, $288,000 ($138,000 + $150,000) will have been recovered. Consequently, the first $12,000 received in Year 3 will recover the initial investment. Because $12,000 represents 8.7% of Year 3 net after-tax cash inflows ($12,000 ÷ $138,000), the payback period is 2.09 years (rounded).
- Answer (D) is incorrect because the amount of 3.00 years is the time required to depreciate the asset fully, not the payback period.

**Fact Pattern #170**
A proposed investment is not expected to have any salvage value at the end of its 5-year life. Because of realistic depreciation practices, the net carrying amount and the salvage value are equal at the end of each year. For present value purposes, cash flows are assumed to occur at the end of each year. The company uses a 12% after-tax target rate of return.

<table>
<thead>
<tr>
<th>Year</th>
<th>Purchase Cost and Carrying Amount</th>
<th>Annual Net After-Tax Cash Flows</th>
<th>Annual Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$500,000</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>1</td>
<td>336,000</td>
<td>240,000</td>
<td>70,000</td>
</tr>
<tr>
<td>2</td>
<td>200,000</td>
<td>216,000</td>
<td>78,000</td>
</tr>
<tr>
<td>3</td>
<td>100,000</td>
<td>192,000</td>
<td>86,000</td>
</tr>
<tr>
<td>4</td>
<td>36,000</td>
<td>168,000</td>
<td>94,000</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>144,000</td>
<td>102,000</td>
</tr>
</tbody>
</table>

**Discount Factors for a 12% Rate of Return**

<table>
<thead>
<tr>
<th>Year</th>
<th>Present Value of $1 at the End of Each Period</th>
<th>Present Value of an Annuity of $1 at the End of Each Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.89</td>
<td>.89</td>
</tr>
<tr>
<td>2</td>
<td>.80</td>
<td>1.69</td>
</tr>
<tr>
<td>3</td>
<td>.71</td>
<td>2.40</td>
</tr>
<tr>
<td>4</td>
<td>.64</td>
<td>3.04</td>
</tr>
<tr>
<td>5</td>
<td>.57</td>
<td>3.61</td>
</tr>
<tr>
<td>6</td>
<td>.51</td>
<td>4.12</td>
</tr>
</tbody>
</table>
The accounting rate of return based on the average investment is

A. 84.9%  
B. 34.4%  
C. 40.8%  
D. 12%

- Answer (A) is incorrect because this percentage equals the NPV divided by the average investment.
- Answer (B) is correct. The accounting rate of return (the unadjusted rate of return or rate of return on the carrying amount) equals the increase in accounting net income divided by either the initial or the average investment. It ignores the time value of money. The average income over 5 years is $86,000 \((($70,000 + $78,000 + $86,000 + $94,000 + $102,000) ÷ 5\). Dividing the $86,000 average net income by the $250,000 average investment \((500,000 \text{ cost} ÷ 2)\) produces an accounting rate of return of 34.4%.
- Answer (C) is incorrect because this percentage equals Year 5 net income divided by the average investment.
- Answer (D) is incorrect because this percentage equals the after-tax target rate of return.

The net present value is

A. $304,060  
B. $212,320  
C. $(70,000)  
D. $712,320

- Answer (A) is incorrect because the amount of $304,060 is the present value of the net income amounts.
- Answer (B) is correct. The NPV method discounts the expected cash flows from a project using the required rate of return. A project is acceptable if its NPV is positive. Based on the interest factors for the present value of $1 at 12% and the annual after-tax cash flows, the NPV of the project over its 5-year life is

\[
\begin{align*}
\text{Total present value} & = \text{NPV} \\
240,000 \times .89 & = 213,600 \\
216,000 \times .80 & = 172,800 \\
192,000 \times .71 & = 136,320 \\
168,000 \times .64 & = 107,520 \\
144,000 \times .57 & = 82,080 \\
\text{Purchase cost} (500,000) & = \text{NPV} (212,320)
\end{align*}
\]

- Answer (C) is incorrect because the amount of $(70,000) is the excess of the net initial investment over the sum of the undiscounted net income amounts.
- Answer (D) is incorrect because the amount of $712,320 is the present value of the cash inflows.
The profitability index is

A. .608  
B. .425  
C. .860  
D. 1.425

- Answer (A) is incorrect because this ratio is the present value of the net income amounts divided by the net initial investment.
- Answer (B) is correct. This ratio is the present value of the estimated future cash inflows over the investment’s life divided by the present value of the net initial investment. The present value of the cash inflows is calculated as follows based on the interest factors for the present value of $1 at 12\% and the annual after-tax cash flows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Inflows</th>
<th>Discount Rate for PV of $1</th>
<th>PV of $1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$240,000</td>
<td>.89</td>
<td>$213,600</td>
</tr>
<tr>
<td>2</td>
<td>216,000</td>
<td>.80</td>
<td>172,800</td>
</tr>
<tr>
<td>3</td>
<td>192,000</td>
<td>.71</td>
<td>136,320</td>
</tr>
<tr>
<td>4</td>
<td>168,000</td>
<td>.64</td>
<td>107,520</td>
</tr>
<tr>
<td>5</td>
<td>144,000</td>
<td>.57</td>
<td>82,080</td>
</tr>
</tbody>
</table>

The NPV equals the present value of the cash inflows minus the present value of the cash outflows. Thus, the profitability index is 0.425 \([($712,320 – $500,000) ÷ $500,000 \text{ net initial investment}]\).

- Answer (C) is incorrect because this ratio is the sum of the undiscounted net income amounts divided by the net initial investment.
- Answer (D) is incorrect because the profitability index equals the NPV of the cash flows divided by the net initial investment.

Which statement about the internal rate of return of the investment is true?

A. The IRR is exactly 12\%.
B. The IRR is over 12\%.
C. The IRR is under 12\%.
D. No information about the IRR can be determined.

- Answer (A) is incorrect because the IRR would be 12\% if the NPV were $0.
Answer (B) is correct. The NPV method discounts the expected cash flows from a project using the required rate of return. A project is acceptable if its NPV is positive. Based on the interest factors for the present value of $1 at 12% and the annual after-tax cash flows, the NPV of the project over its 5-year life is

\[
\begin{align*}
$240,000 \times 0.89 &= 213,600 \\
216,000 \times 0.80 &= 172,800 \\
192,000 \times 0.71 &= 136,320 \\
168,000 \times 0.64 &= 107,520 \\
144,000 \times 0.57 &= 82,080 \\
\end{align*}
\]

Total present value: $712,320

Purchase cost: (500,000)

NPV: $212,320

Given that the NPV is positive, the investment project should be accepted assuming no capital rationing. Furthermore, the IRR (the discount rate that reduces the NPV to $0) must be greater than the 12% hurdle rate that produced a positive NPV. The higher the discount rate, the lower the NPV.

- Answer (C) is incorrect because the IRR would be under 12% if the NPV were negative.
- Answer (D) is incorrect because whether the IRR is equal to, less than, or greater than the after-tax target rate of return can be determined from the amount of the NPV.
Yipann Corporation is reviewing an investment proposal. The initial cost, as well as other related data for each year, are presented in the schedule below. All cash flows are assumed to take place at the end of the year. The salvage value of the investment at the end of each year is equal to its net book value, and there will be no salvage value at the end of the investment’s life.

<table>
<thead>
<tr>
<th>Year</th>
<th>Initial Cost and Book Value</th>
<th>Annual Net After-Tax Cash Flows</th>
<th>Annual Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$105,000</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>1</td>
<td>70,000</td>
<td>50,000</td>
<td>15,000</td>
</tr>
<tr>
<td>2</td>
<td>42,000</td>
<td>45,000</td>
<td>17,000</td>
</tr>
<tr>
<td>3</td>
<td>21,000</td>
<td>40,000</td>
<td>19,000</td>
</tr>
<tr>
<td>4</td>
<td>7,000</td>
<td>35,000</td>
<td>21,000</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>30,000</td>
<td>23,000</td>
</tr>
</tbody>
</table>

Yipann uses a 24% after-tax target rate of return for new investment proposals. The discount factors for a 24% rate of return are given.

<table>
<thead>
<tr>
<th>Year</th>
<th>Present Value of $1.00 Received at the End of Each Period</th>
<th>Present Value of an Annuity of $1.00 Received at the End of Each Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.81</td>
<td>.81</td>
</tr>
<tr>
<td>2</td>
<td>.65</td>
<td>1.46</td>
</tr>
<tr>
<td>3</td>
<td>.52</td>
<td>1.98</td>
</tr>
<tr>
<td>4</td>
<td>.42</td>
<td>2.40</td>
</tr>
<tr>
<td>5</td>
<td>.34</td>
<td>2.74</td>
</tr>
<tr>
<td>6</td>
<td>.28</td>
<td>3.02</td>
</tr>
<tr>
<td>7</td>
<td>.22</td>
<td>3.24</td>
</tr>
</tbody>
</table>

The average annual cash inflow at which Yipann would be indifferent to the investment (rounded to the nearest dollar) is

A. $21,000
B. $40,000
C. $38,321
D. $46,667

- Answer (A) is incorrect because the amount of $21,000 is the initial cost divided by the life of the asset.
- Answer (B) is incorrect because the amount of $40,000 is the average of the net after-tax cash flows.
- Answer (C) is correct. This problem requires the use of the net present value (NPV) method of investment analysis. The objective is to determine what average annual net cash inflow will equal the initial cost when discounted at a rate of 24%. Given that the investment has an expected life of 5 years, the appropriate time value of money factor is that for the present value of an ordinary annuity for 5 years at 24%. In this case, the annual net cash inflow is unknown, but the product of the factor (2.74) and the inflow is $105,000. Thus, dividing $105,000 by 2.74 results in an average annual net cash inflow of $38,321. In other words, if annual inflows are $38,321 per year, the present value is $105,000. This present value is equal to the initial cost, and the net present value is zero. At a net present value of zero, the investor is indifferent as to whether to undertake the investment.
Answer (D) is incorrect because the amount of $46,667 is the initial cost divided by the payback period.

Refers to Fact Pattern #171

The accounting rate of return for the investment proposal over its life using the initial value of the investment is

A. 36.2%
B. 18.1%
C. 28.1%
D. 38.1%

Answer (A) is incorrect because the accounting rate of return (or unadjusted rate of return) is computed by dividing the annual increase in accounting net income by the required investment.

Answer (B) is correct. The accounting rate of return (or unadjusted rate of return) is computed by dividing the annual increase in accounting net income by the required investment. The average net income over the life of the investment is $19,000 ([$15,000 + $17,000 + $19,000 + $21,000 + $23,000] / 5 years). Consequently, the accounting rate of return is 18.1% ($19,000 / $105,000).

Answer (C) is incorrect because the accounting rate of return (or unadjusted rate of return) is computed by dividing the annual increase in accounting net income by the required investment. The percentage 28.1% is calculated by dividing the average of the average net after-tax cash flows and the average of the net income by the required investment.

Answer (D) is incorrect because this percentage is calculated by dividing the average net after-tax cash flows by the required investment.

Refers to Fact Pattern #171

The net present value of the investment proposal is

A. $4,600
B. $10,450
C. $(55,280)
D. $115,450

Answer (A) is incorrect because the net present value is computed by deducting the initial cost of the investment from the present value of the future net cash flows.

Answer (B) is correct. The net present value is computed by deducting the initial cost of the investment from the present value of the future net cash flows. The present value of each of the future net cash flows is determined by multiplying it by the appropriate factor for the present value of an amount as shown below. The net present value is $10,450 ($115,450 – $105,000).

<table>
<thead>
<tr>
<th>Cash Flow</th>
<th>Discount Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50,000</td>
<td>.81</td>
<td>$40,500</td>
</tr>
<tr>
<td>45,000</td>
<td>.65</td>
<td>$29,250</td>
</tr>
<tr>
<td>40,000</td>
<td>.52</td>
<td>$20,800</td>
</tr>
<tr>
<td>35,000</td>
<td>.42</td>
<td>$14,700</td>
</tr>
<tr>
<td>30,000</td>
<td>.34</td>
<td>$10,200</td>
</tr>
</tbody>
</table>

Total $115,450

Answer (C) is incorrect because the amount of $(55,280) is calculated by discounting the annual net income rather than the future net cash flows.

Answer (D) is incorrect because the amount of $115,450 is the present value of the future net cash flows.
The traditional payback period for the investment proposal is

A. 0.875 years.
B. 1.833 years.
C. 2.250 years.
D. More than 5 years.

- Answer (A) is incorrect because this figure is calculated by adding the book value and cash flows to figure the recovery of the initial investment.
- Answer (B) is incorrect because this figure is calculated using the book values instead of the cash flows to figure the recovery of the initial investment.
- Answer (C) is correct. The payback period is the time required to recover the initial investment. The net cash inflows used to determine the payback period are not discounted. The initial cost was $105,000, and inflows during the first 2 years were $95,000 ($50,000 + $45,000). Thus, the first $10,000 ($105,000 – $95,000) of the third year’s net cash inflows will complete the recovery of the initial investment. This amount is one-fourth of the third year’s inflows. Hence, the payback period is 2.25 years.
- Answer (D) is incorrect because more than 5 years is calculated using net income instead of cash flows to figure the recovery of the initial investment.

Rex Company is considering an investment in a new plant, which will entail an immediate capital expenditure of $4,000,000. The plant is to be depreciated on a straight-line basis over 10 years to zero salvage value. Operating income (before depreciation and taxes) is expected to be $800,000 per year over the 10-year life of the plant. The opportunity cost of capital is 14%. Assume that there are no taxes.

What is the book (or accounting) rate of return for the investment using the average investment method?

A. 10%
B. 20%
C. 28%
D. 35%

- Answer (A) is incorrect because this percentage is based on initial cost rather than average book value.
- Answer (B) is correct. The book rate of return is calculated as follows:

$$\text{Operating revenues} = \$800,000$$
$$\text{Less: depreciation} = (400,000)$$
$$\text{Book income} = \$400,000$$

Average book value of investment $$\left[\frac{\$4,000,000 + 0}{2}\right] = \$2,000,000$$

Book rate of return: $$\frac{\$400,000}{\$2,000,000} = 20\%$$

- Answer (C) is incorrect because this percentage is not based on average book value, nor did they treat expenses properly.
Answer (D) is incorrect because this percentage is not based on average book value, nor did they treat expenses properly.

*Answer (D) is incorrect because this percentage is not based on average book value, nor did they treat expenses properly.*

**Fact Pattern #172**

What is the discounted payback period for the investment?

A. 5.5 years.  
B. 7.1 years.  
C. 9.2 years.  
D. 11.7 years.

- Answer (A) is incorrect because in 5.5 years only $2,928,800 of the initial investment would be paid back.  
- Answer (B) is incorrect because in 7.1 years only $3,458,480 of the initial investment would be paid back.  
- Answer (C) is correct. The discounted payback period is the number of years needed to get the PV of the cash flows to equal the initial investment. At a 14% discount rate, this occurs at 9.2 years. The inflows during the first 9 years are $3,956,800 ($800,000 × 4.946). The remaining amount from the initial investment that must be recovered in the tenth year is $43,200 ($4,000,000 – $3,956,800). This amount is one-fifth of the tenth year’s discounted inflow [($43,200 ÷ ($800,000 × .270)]. Thus, the discounted payback period is 9.2.  
- Answer (D) is incorrect because after 11.7 years $4,478,880 of the initial investment would be paid back.

**Fact Pattern #172**

What is the NPV for the investment?

A. $172,800  
B. $(1,913,600)  
C. $520,000  
D. $362,400

- Answer (A) is correct. The NPV is the difference between the present value of the estimated net cash inflows and the present value of the net cash outflows. The present value of the net cash inflows discounted at 14% is $4,172,800 [$800,000(5.216)]. Therefore, the NPV of the investment is $172,800 ($4,172,800 – $4,000,000).  
- Answer (B) is incorrect because a NPV of $1,913,600 was calculated using the operating income rather than the cash inflows.  
- Answer (C) is incorrect because a NPV of $520,000 was calculated using the incorrect discount rate of 12%.  
- Answer (D) is incorrect because a NPV of $362,400 was calculated using the incorrect time period of 11 years.

**Fact Pattern #173**

Don Adams Breweries is considering an expansion project with an investment of $1,500,000. The equipment will be depreciated to zero salvage value on a straight-line basis over 5 years. The expansion will produce incremental operating revenue of $400,000 annually for 3 years. The company’s opportunity cost of capital is 12%. Ignore taxes.
What is the NPV of the investment?

A. $0
B. $(58,000)
C. $(116,000)
D. $1,442,000

- Answer (A) is incorrect because there is a negative NPV.
- Answer (B) is correct. First, calculate the annual earnings and cash flows:

Operating revenues $400,000
Less: depreciation (300,000)
Book income $100,000
Cash flow $400,000

The cash flows associated with the investment are then discounted accordingly:

<table>
<thead>
<tr>
<th>Year</th>
<th>Discount Amount</th>
<th>Discount Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0 initial investment</td>
<td>$(1,500,000)</td>
<td>1</td>
<td>$(1,500,000)</td>
</tr>
<tr>
<td>Years 1 through 5 cash flow</td>
<td>400,000</td>
<td>3.605</td>
<td>1,442,000</td>
</tr>
<tr>
<td>Net Present Value</td>
<td></td>
<td></td>
<td>$ (58,000)</td>
</tr>
</tbody>
</table>

- Answer (C) is incorrect because the amount of $(116,000) overstates the negative NPV.
- Answer (D) is incorrect because the amount of $1,442,000 is the present value of the future cash flows, not the NPV.

What is the IRR of the investment?

A. 10.43%
B. 12.68%
C. 16.32%
D. 19.17%
Answer (A) is correct. First, calculate the annual earnings and cash flows:

Operating revenues $400,000
Less depreciation 300,000
Book income 100,000
Cash flow 400,000

IRR is calculated by trial and error. Calculate the NPV at different discount rates.

NPV at 10% = ($400,000 × discount factor for 10%, 5 years) – $1,500,000
= $400,000 × 3.791 – $1,500,000 = $16,400
NPV at 11% = $400,000 × 3.696 – $1,500,000 = –$21,600

Thus, IRR lies between 10% and 11%. By interpolation, the actual IRR appears to be 10.43% \{10 + [16,400 ÷ (16,400 + 21,600)]\}.

NOTE: The Test Prep NPV tables do not contain the factor for 11%. You can deduce the answer using the factor for 12%, but you can’t interpolate.

Answer (B) is incorrect because it uses something other than cash flows in the calculation.

Answer (C) is incorrect because it uses something other than cash flows in the calculation.

Answer (D) is incorrect because it uses something other than cash flows in the calculation.

---

What is the book (accounting) rate of return of the investment using the average investment method?

A. 6.67%
B. 13.33%
C. 16.67%
D. 26.67%

Answer (A) is incorrect because this percentage used the entire investment in the denominator instead of the average investment.

Answer (B) is correct. First, calculate the annual earnings and cash flows:

Operating revenues $400,000
Less: depreciation (300,000)
Book income $100,000
Cash flow $400,000

The average book income is $100,000. The average book value of investment is $750,000 \{($1,500,000 + 0) ÷ 2\}. Thus, the book rate of return is equal to 13.33% \($100,000 ÷ 750,000\).

Answer (C) is incorrect because this percentage uses both an incorrect numerator and denominator.

Answer (D) is incorrect because this percentage uses revenue in the numerator instead of income, and the entire investment in the denominator instead of the average investment.
What is the payback period of the project?

A. 2 years.  
B. 2.14 years.  
C. 3.75 years.  
D. 5 years.

- Answer (A) is incorrect because the initial investment is divided by the annual cash flows.  
- Answer (B) is incorrect because this figure results from adding depreciation to revenues for use in the denominator.  
- Answer (C) is correct. First, calculate the annual earnings and cash flows:

<table>
<thead>
<tr>
<th>Operating revenues</th>
<th>$400,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less: depreciation</td>
<td>(300,000)</td>
</tr>
<tr>
<td>Book income</td>
<td>$100,000</td>
</tr>
<tr>
<td>Cash flow</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

The payback period in this case is equal to the investment divided by the annual operating cash flows that result from that investment. Thus, the payback period is 3.75 years ($1,500,000 ÷ $400,000).

- Answer (D) is incorrect because the denominator is annual cash flows, not depreciation.

**[Fact Pattern #174]**

Tonya, Inc., has a cost of capital of 15% and is considering the acquisition of a new machine that costs $800,000 and has a useful life of 5 years. Tonya projects that earnings and cash flow will increase as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Earnings</th>
<th>After-Tax Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$200,000</td>
<td>$320,000</td>
</tr>
<tr>
<td>2</td>
<td>200,000</td>
<td>280,000</td>
</tr>
<tr>
<td>3</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
<td>4</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
<td>5</td>
<td>200,000</td>
<td>200,000</td>
</tr>
</tbody>
</table>

Interest rate factors at 15% are as follows:

<table>
<thead>
<tr>
<th>Period</th>
<th>Present Value of $1</th>
<th>Present Value of an Annuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.87</td>
<td>0.87</td>
</tr>
<tr>
<td>2</td>
<td>.76</td>
<td>1.63</td>
</tr>
<tr>
<td>3</td>
<td>.66</td>
<td>2.29</td>
</tr>
<tr>
<td>4</td>
<td>.57</td>
<td>2.86</td>
</tr>
<tr>
<td>5</td>
<td>.50</td>
<td>3.36</td>
</tr>
</tbody>
</table>
What is the payback period of this investment?

A. 1.5 years.
B. 3.0 years.
C. 3.3 years.
D. 4.0 years.

- Answer (A) is incorrect because only a little over half of the initial $800,000 investment would have been recovered by the end of 1.5 years.
- Answer (B) is correct. The payback method is simply the time required to recover the investment. It does not consider the time value of money or returns after the payback period. When cash flows are not uniform, a cumulative calculation is necessary. Thus, 3.0 years is the payback period ($320,000 in the first year, $280,000 in the second year, and $200,000 in the third year).
- Answer (C) is incorrect because the amount of $800,000 will have been recovered by the end of 3 years.
- Answer (D) is incorrect because this number of years is based on net earnings.

The net present value of this investment is

A. $(128,000)
B. $200,000
C. $37,200
D. $400,000

- Answer (A) is incorrect because the amount of $(128,000) is based on a discounting of the net earnings rather than on cash flows.
- Answer (B) is incorrect because the amount of $200,000 equals total undiscounted net earnings minus the initial investment.
- Answer (C) is correct. The NPV is calculated by discounting the after-tax cash flows from an investment by the cost of capital:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
<th>Discount Factor</th>
<th>Present Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>320,000</td>
<td>.87</td>
<td>278,400</td>
</tr>
<tr>
<td>2</td>
<td>280,000</td>
<td>.76</td>
<td>212,800</td>
</tr>
<tr>
<td>3</td>
<td>200,000</td>
<td>.66</td>
<td>132,000</td>
</tr>
<tr>
<td>4</td>
<td>200,000</td>
<td>.57</td>
<td>114,000</td>
</tr>
<tr>
<td>5</td>
<td>200,000</td>
<td>.50</td>
<td>100,000</td>
</tr>
</tbody>
</table>

Present value of inflows $837,200

Subtracting the $800,000 initial cost from the $837,200 present value of the future inflows produces an NPV of $37,200.
- Answer (D) is incorrect because the amount of $400,000 equals the undiscounted after-tax cash flows minus the initial cost.
What is the profitability index for the investment?

A. 0.50
B. 0.96
C. 1.05
D. 1.25

- Answer (A) is incorrect because this figure results from using the NPV in the numerator.
- Answer (B) is incorrect because this figure reverses the numerator and denominator of the calculation.
- Answer (C) is correct. The profitability index is the present value of the future cash flows divided by the present value of the net initial investment. The present value of the future cash flows is $837,200. Dividing the $800,000 initial cost of the investment into the $837,200 present value of the future cash inflows produces a profitability index of approximately 1.05. Any profitability index greater than one is considered acceptable.
- Answer (D) is incorrect because this figure uses undiscounted earnings in the numerator instead of the present value of future net cash flows.

The Keego Company is planning a $200,000 equipment investment that has an estimated 5-year life with no estimated salvage value. The company has projected the following annual cash flows for the investment:

<table>
<thead>
<tr>
<th>Year</th>
<th>Projected Cash Inflows</th>
<th>Present Value of $1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$120,000</td>
<td>.91</td>
</tr>
<tr>
<td>2</td>
<td>60,000</td>
<td>.76</td>
</tr>
<tr>
<td>3</td>
<td>40,000</td>
<td>.63</td>
</tr>
<tr>
<td>4</td>
<td>40,000</td>
<td>.53</td>
</tr>
<tr>
<td>5</td>
<td>40,000</td>
<td>.44</td>
</tr>
<tr>
<td>Totals</td>
<td>$300,000</td>
<td>3.27</td>
</tr>
</tbody>
</table>

Assuming that the estimated cash inflows occur evenly during each year, the payback period for the investment is

A. 1.67 years.
B. 4.91 years.
C. 2.50 years.
D. 1.96 years.

- Answer (A) is incorrect because this number of years assumes that the inflows of the first year continue at the same rate in the second year.
- Answer (B) is incorrect because the amount of $296,400 will be recovered after 4.91 years.
- Answer (C) is correct. The payback period is the number of years required to complete the return of the original investment. The principal problems with the payback method are that it does not consider the time value of money and the inflows after the payback period. The inflow for the first year is $120,000, the second year is $60,000, and the third year is $40,000, a total of $220,000. Given an initial investment of $200,000, the payback period must be between 2 and 3 years. If the cash inflows occur evenly throughout the year, $20,000 ($200,000 – $120,000 – $60,000) of cash inflows are needed in year 3, which is 50% of that year’s total. Thus, the answer is 2.5 years.
Answer (D) is incorrect because Less than $180,000 will be paid back after 1.96 years.

[1618] (Refers to Fact Pattern #175)
The net present value for the investment is

A. $18,800
B. $218,800
C. $100,000
D. $91,743

Answer (A) is correct. The NPV is defined as the excess of the present value of the net cash inflows over the net cost of the investment. Discounting the future cash inflows by the present value factors results in an $18,800 NPV ($218,800 – $200,000).

$120,000 × .91 = $109,200
60,000 × .76 = 45,600
40,000 × .63 = 25,200
40,000 × .53 = 21,200
40,000 × .44 = 17,600

$218,800

Answer (B) is incorrect because The amount of $218,800 is the present value of the future net cash inflows.

Answer (C) is incorrect because The amount of $100,000 is the excess of the undiscounted cash flows over the investment.

Answer (D) is incorrect because The amount of $91,743 is based on dividing the $300,000 total inflows by the total of all present value factors, which produces a nonsense answer.

[Fact Pattern #176]
Willis, Inc., has a desired rate of return of 15% and is considering the acquisition of a new machine that costs $400,000 and has a useful life of 5 years. Willis projects that earnings and cash flow will increase as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Earnings</th>
<th>After-Tax Cash Flow</th>
<th>15% Interest Rate Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Present Value of $1</td>
</tr>
<tr>
<td>Period</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>100,000</td>
<td>160,000</td>
<td>0.87</td>
</tr>
<tr>
<td>2</td>
<td>100,000</td>
<td>140,000</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>100,000</td>
<td>100,000</td>
<td>0.87</td>
</tr>
<tr>
<td>4</td>
<td>100,000</td>
<td>100,000</td>
<td>1.63</td>
</tr>
<tr>
<td>5</td>
<td>200,000</td>
<td>100,000</td>
<td>2.86</td>
</tr>
</tbody>
</table>

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What is the payback period of Willis’ investment?

A. 1.5 years.
B. 3.0 years.
C. 3.3 years.
D. 4.0 years.

- Answer (A) is incorrect because Only $230,000 would have been recovered after 1.5 years.
- Answer (B) is correct. The payback method calculates the number of years required to complete the return of the original investment. The initial cost is $400,000, so Willis will recoup its investment in 3 years ($160,000 in year 1 + $140,000 in year 2 + $100,000 in year 3).
- Answer (C) is incorrect because This number of years is not the payback period.
- Answer (D) is incorrect because This number of years is based on net earnings rather than cash flows.

The net present value of Willis’ investment is

A. Negative, $64,000.
B. Negative, $14,000.
C. Positive, $18,600.
D. Positive, $200,000.

- Answer (A) is incorrect because A negative NPV of $64,000 assumes net cash flows of $100,000 per year.
- Answer (B) is incorrect because A negative NPV of $14,000 results from discounting the net earnings.
- Answer (C) is correct. The NPV is calculated by discounting the after-tax cash flows by the desired rate of return. The cash flows of this company constitute an annuity of $100,000 per year plus additional flows of $60,000 in Year 1 and $40,000 in Year 2. Thus, the present value of these flows is $418,600 [($100,000 × 3.36 PV of an annuity of $1 for 5 periods at 15%) + ($60,000 × .87 PV of $1 for 1 period at 15%) + ($40,000 × .76 PV of $1 for 2 periods at 15%)]. The NPV is therefore $18,600 ($418,600 – $400,000).
- Answer (D) is incorrect because The amount of $200,000 is the undiscounted excess of the cash flows over the investment.

For capital budgeting purposes, management would select a high hurdle rate of return for certain projects because management

A. Wants to use equity funding exclusively.
B. Believes too many proposals are being rejected.
C. Believes bank loans are riskier than capital investments.
D. Wants to factor risk into its consideration of projects.

- Answer (A) is incorrect because The nature of the funding may not be a sufficient reason to use a risk-adjusted rate. The type of funding is just one factor affecting the risk of a project.
- Answer (B) is incorrect because A higher hurdle will result in rejection of more projects.
- Answer (C) is incorrect because A risk-adjusted high hurdle rate is used for capital investments with greater risk.
Answer (D) is correct. Risk analysis attempts to measure the likelihood of the variability of future returns from the proposed investment. Risk can be incorporated into capital budgeting decisions in a number of ways, one of which is to use a hurdle rate (desired rate of return) higher than the firm’s cost of capital, that is, a risk-adjusted discount rate. This technique adjusts the interest rate used for discounting upward as an investment becomes riskier. The expected flow from the investment must be relatively larger or the increased discount rate will generate a negative net present value, and the proposed acquisition will be rejected.

A company uses portfolio theory to develop its investment portfolio. If the company wishes to obtain optimal risk reduction through the portfolio effect, it should make its next investment in an investment that

A. Correlates negatively to the current portfolio holdings.
B. Is uncorrelated to the current portfolio holdings.
C. Is highly correlated to the current portfolio holdings.
D. Is perfectly correlated to the current portfolio holdings.

Answer (A) is correct. A common general definition is that risk is an investment with an unknown outcome but a known probability distribution of returns (a known mean and standard deviation). An increase in the standard deviation (variability) of returns is synonymous with an increase in the riskiness of a project. Risk is also increased when the project’s returns are positively (directly) correlated with other investments in the company’s portfolio; that is, risk increases when returns on all projects rise or fall together. Consequently, the overall risk is decreased when projects have low variability and are negatively correlated (the diversification effect).

Answer (B) is incorrect because Uncorrelated investments are more risky than negatively correlated investments.

Answer (C) is incorrect because Correlated investments are very risky.

Answer (D) is incorrect because Correlated investments are very risky.

Mega, Inc., a large conglomerate with operating divisions in many industries, uses risk-adjusted discount rates in evaluating capital investment decisions. Consider the following statements concerning Mega’s use of risk-adjusted discount rates.

I. Mega may accept some investments with internal rates of return less than Mega’s overall average cost of capital.
II. Discount rates vary depending on the type of investment.
III. Mega may reject some investments with internal rates of return greater than the cost of capital.
IV. Discount rates may vary depending on the division.

Which of the above statements are correct?

A. I and III only.
B. II and IV only.
C. II, III, and IV only.
D. I, II, III, and IV.

Answer (A) is incorrect because Discount rates may vary with the project or with the subunit of the organization.

Answer (B) is incorrect because The company may accept some projects with IRRs less than the cost of capital or reject some project with IRRs greater than the cost of capital.

Answer (C) is incorrect because The company may accept some projects with IRRs less than the cost of capital or reject some project with IRRs greater than the cost of capital.
• Answer (D) is correct. Risk analysis attempts to measure the likelihood of the variability of future returns from the proposed investment. Risk can be incorporated into capital budgeting decisions in a number of ways, one of which is to use a hurdle rate higher than the firm’s cost of capital, that is, a risk-adjusted discount rate. This technique adjusts the interest rate used for discounting upward as an investment becomes riskier. The expected flow from the investment must be relatively larger, or the increased discount rate will generate a negative net present value, and the proposed acquisition will be rejected. Accordingly, the IRR (the rate at which the NPV is zero) for a rejected investment may exceed the cost of capital when the risk-adjusted rate is higher than the IRR. Conversely, the IRR for an accepted investment may be less than the cost of capital when the risk-adjusted rate is less than the IRR. In this case, the investment presumably has very little risk. Furthermore, risk-adjusted rates may also reflect the differing degrees of risk, not only among investments, but by the same investments undertaken by different organizational subunits.

Sensitivity analysis, if used with capital projects,

A. Is used extensively when cash flows are known with certainty.
B. Measures the change in the discounted cash flows when using the discounted payback method rather than the net present value method.
C. Is a “what-if” technique that asks how a given outcome will change if the original estimates of the capital budgeting model are changed.
D. Is a technique used to rank capital expenditure requests.

• Answer (A) is incorrect because Sensitivity analysis is useful when cash flows or other assumptions are uncertain.
• Answer (B) is incorrect because Sensitivity analysis can be used with any of the capital budgeting methods.
• Answer (C) is correct. After a problem has been formulated into any mathematical model, it may be subjected to sensitivity analysis, which is a trial-and-error method used to determine the sensitivity of the estimates used. For example, forecasts of many calculated NPVs under various assumptions may be compared to determine how sensitive the NPV is to changing conditions. Changing the assumptions about a certain variable or group of variables may drastically alter the NPV, suggesting that the risk of the investment may be excessive.
• Answer (D) is incorrect because Sensitivity analysis is not a ranking technique; it calculates results under varying assumptions.

An analysis of a company’s planned equity financing using the Capital Asset Pricing Model (or Security Market Line) incorporates only the

A. Expected market earnings, the current U.S. Treasury bond yield, and the beta coefficient.
B. Expected market earnings and the price-earnings ratio.
C. Current U.S. Treasury bond yield, the price-earnings ratio, and the beta coefficient.
D. Current U.S. Treasury bond yield and the dividend payout ratio.

• Answer (A) is correct. The capital asset pricing model adds the risk-free rate to the product of the market risk premium and the beta coefficient. The market risk premium is the amount above the risk-free rate (approximated by the U.S. Treasury bond yield) that must be paid to induce investment in the market. The beta coefficient of an individual stock is the correlation between the price volatility of the stock market as a whole and the price volatility of the individual stock.
• Answer (B) is incorrect because The price-earnings ratio is not a component of the model.
• Answer (C) is incorrect because The price-earnings ratio is not a component of the model.
• Answer (D) is incorrect because The dividend payout ratio is not a component of the model.
The proper discount rate to use in calculating certainty equivalent net present value is the

A. Risk-adjusted discount rate.
B. Cost of capital.
C. Risk-free rate.
D. Cost of equity capital.

- Answer (A) is incorrect because a risk-adjusted discount rate does not represent an absolutely certain rate of return. A discount rate is adjusted upward as the investment becomes riskier.
- Answer (B) is incorrect because the cost of capital has nothing to do with certainty equivalence.
- Answer (C) is correct. Rational investors choose projects that yield the best return given some level of risk. If an investor desires no risk, that is, an absolutely certain rate of return, the risk-free rate is used in calculating net present value. The risk-free rate is the return on a risk-free investment such as government bonds. Certainty equivalent adjustments involve a technique directly drawn from utility theory. It forces the decision maker to specify at what point the firm is indifferent to the choice between a sum of money that is certain and the expected value of a risky sum.
- Answer (D) is incorrect because the cost of equity capital does not equate to a certainty equivalent rate.

When the risks of the individual components of a project’s cash flows are different, an acceptable procedure to evaluate these cash flows is to

A. Divide each cash flow by the payback period.
B. Compute the net present value of each cash flow using the firm’s cost of capital.
C. Compare the internal rate of return from each cash flow to its risk.
D. Discount each cash flow using a discount rate that reflects the degree of risk.

- Answer (A) is incorrect because the payback period ignores both the varying risk and the time value of money.
- Answer (B) is incorrect because using the cost of capital as the discount rate does not make any adjustment for the risk differentials among the various cash flows.
- Answer (C) is incorrect because risk has to be incorporated into the company’s hurdle rate to use the internal rate of return method with risk differentials.
- Answer (D) is correct. Risk-adjusted discount rates can be used to evaluate capital investment options. If risks differ among various elements of the cash flows, then different discount rates can be used for different flows.

A manager wants to know the effect of a possible change in cash flows on the net present value of a project. The technique used for this purpose is

A. Sensitivity analysis.
B. Risk analysis.
C. Cost behavior analysis.
D. Return on investment analysis.

- Answer (A) is correct. Sensitivity analysis is a technique to evaluate a model in terms of the effect of changing the values of the parameters. It answers “what if” questions. In capital budgeting models, sensitivity analysis is the examination of alternative outcomes under different assumptions.
- Answer (B) is incorrect because probability (risk) analysis is used to examine the array of possible outcomes given alternative parameters.
Answer (C) is incorrect because Cost behavior (variance) analysis concerns historical costs, not predictions of future cash inflows and outflows.

Answer (D) is incorrect because ROI analysis is appropriate for determining the profitability of a company, segment, etc.

A widely used approach that is used to recognize uncertainty about individual economic variables while obtaining an immediate financial estimate of the consequences of possible prediction errors is

A. Expected value analysis.
B. Learning curve analysis.
C. Sensitivity analysis.
D. Regression analysis.

Answer (A) is incorrect because Expected value analysis provides a rational means for selecting the best alternative for decisions involving risk by multiplying the probability of each outcome by its payoff, and summing the products. It represents the long-term average payoff for repeated trials.

Answer (B) is incorrect because Learning curves reflect the increased rate at which people perform tasks as they gain experience.

Answer (C) is correct. Sensitivity analysis recognizes uncertainty about estimates by making several calculations using varying estimates. For instance, several forecasts of net present value (NPV) might be calculated under various assumptions to determine the sensitivity of the NPV to changing conditions or prediction errors. Changing or relaxing the assumptions about a certain variable or group of variables may drastically alter the NPV, resulting in a much riskier asset than was originally forecast.

Answer (D) is incorrect because Regression analysis is used to find an equation for the linear relationships among variables.

Sensitivity analysis is used in capital budgeting to

A. Estimate a project’s internal rate of return.
B. Determine the amount that a variable can change without generating unacceptable results.
C. Identify the required market share to make a new product viable and produce acceptable results.
D. Simulate probabilistic customer reactions to a new product.

Answer (A) is incorrect because Sensitivity analysis is a means of making several estimates of inputs into a capital budgeting decision to determine the effect of changes in assumptions.

Answer (B) is correct. After a problem has been formulated into any mathematical model, it may be subjected to sensitivity analysis, which is a trial-and-error method used to determine the sensitivity of the estimates used. For example, forecasts of many calculated NPVs under various assumptions may be compared to determine how sensitive the NPV is to changing conditions. Changing the assumptions about a certain variable or group of variables may drastically alter the NPV, suggesting that the risk of the investment may be excessive.

Answer (C) is incorrect because Sensitivity analysis is not a simulation technique; it is simply a process of making more than one estimate of unknown variables.

Answer (D) is incorrect because Sensitivity analysis would not identify the required market share; instead, it would be used to make several estimates of market share to determine how sensitive the decision is to changes in market share.
When determining net present value in an inflationary environment, adjustments should be made to:

A. Increase the discount rate only.
B. Increase the estimated cash inflows and increase the discount rate.
C. Increase the estimated cash inflows but not the discount rate.
D. Decrease the estimated cash inflows and increase the discount rate.

- Answer (A) is incorrect because future cash flows should also increase.
- Answer (B) is correct. In an inflationary environment, nominal future cash flows should increase to reflect the decrease in the value of the unit of measure. Also, the investor should increase the discount rate to reflect the increased inflation premium arising from the additional uncertainty. Lenders will require a higher interest rate in an inflationary environment.
- Answer (C) is incorrect because the discount rate should be increased to take into consideration future uncertainty and the risk premium that lenders will require in an inflationary environment.
- Answer (D) is incorrect because cash flows should increase in an inflationary environment.

When evaluating a capital budgeting project, a company’s treasurer wants to know how changes in operating income and the number of years in the project’s useful life will affect its breakeven internal rate of return. The treasurer is most likely to use:

A. Scenario analysis.
B. Sensitivity analysis.
C. Monte Carlo simulation.
D. Learning curve analysis.

- Answer (A) is incorrect because scenario analysis is not used for quantitative calculations.
- Answer (B) is correct. Forecasts of many calculated NPVs under various assumptions are compared to see how sensitive NPV is to changing conditions. Changing or relaxing the assumptions about a certain variable or group of variables may drastically alter the NPV. Thus, the asset may appear to be much riskier than was originally predicted. In summary, sensitivity analysis is simply an iterative process of recalculated returns based on changing assumptions.
- Answer (C) is incorrect because Monte Carlo simulation is used to account for an element of randomness. The changes in operating income and life of the project in this situation are under the control of the person running the simulation and thus are not random.
- Answer (D) is incorrect because learning curve analysis is used to anticipate the increased rate at which people perform tasks as they gain experience; it is not an appropriate tool for capital budgeting.
A company is evaluating the possible introduction of a new version of an existing product that will have a 2-year life cycle. At the end of 2 years, this version will be obsolete, with no additional cash flows or salvage value. The initial and sole outlay for the modified product is $6 million, and the company’s desired rate of return is 10%. Following are the potential cash flows (assumed to occur at the end of each year) and their probabilities if the product is marketed:

The following interest factors for the present value of $1 at 10% are relevant:

<table>
<thead>
<tr>
<th>Period</th>
<th>Interest Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.909</td>
</tr>
<tr>
<td>2</td>
<td>0.826</td>
</tr>
</tbody>
</table>

The project’s net present value is

A. $878,050
B. $3,242,050
C. $3,636,000
D. $6,000,000

- Answer (A) is correct. The expected value of the cash flows at the end of Year 1 is $4 million \([0.3 \times 2 \text{ million} + 0.4 \times 4 \text{ million} + 0.3 \times 6 \text{ million}]\), and the present value of this amount is $3,636,000 \([0.909 \times 4 \text{ million}]\). The expected value of the cash flows at the end of Year 2 is $3,925,000 \([0.3 \times 0.5 \times 0 + 0.3 \times 0.5 \times 4 \text{ million} + 0.4 \times 0.25 \times 6.4 \text{ million} + 0.4 \times 0.75 \times 3.2 \text{ million} + 0.3 \times 0.4 \times 6.875 \text{ million} + 0.3 \times 0.6 \times 5 \text{ million}]\), and the present value of this amount is $3,242,050 \([0.826 \times 3,925,000]\). Hence, the NPV is $878,050 \([($3,636,000 + $3,242,050) - 6 \text{ million initial outlay}]\).
- Answer (B) is incorrect because the amount of $3,242,050 equals the expected present value of the Year 2 cash flows.
- Answer (C) is incorrect because the amount of $3,636,000 equals the expected present value of the Year 1 cash flows.
- Answer (D) is incorrect because the amount of $6,000,000 equals the initial outlay.
Assume the company has the real option to abandon the project at the end of Year 1. If the salvage value at that time is $3 million and the desired rate of return remains at 10%, what is the project’s net present value?

A. $878,050  
B. $1,200,550  
C. $2,746,450  
D. $4,454,100

- Answer (A) is incorrect because The amount of $878,050 equals the NPV with no real option of abandonment.
- Answer (B) is correct. If the cash flows at the end of Year 1 equal $2 million, the expected value of the Year 2 cash flows is only $2 million \( (.5 \times 0) + (.5 \times $4 \text{ million}) \). If the cash flows at the end of year 1 equal $4 million or $6 million, the expected value of the Year 2 cash flows equals $4 million \( (.25 \times $6.4 \text{ million}) + (.75 \times $3.2 \text{ million}) \) or $5.75 million \( (.4 \times $6.875 \text{ million}) + (.6 \times $5 \text{ million}) \), respectively. After discounting these expected values to the end of Year 1, the present values are $1,818,000 \( (.909 \times $2 \text{ million}) \) given a $2 million Year 1 cash flow, $3,636,000 \( (.909 \times $4 \text{ million}) \) given a $4 million Year 1 cash flow, and $5,226,750 \( (.909 \times $5.75 \text{ million}) \) given a $6 million Year 1 cash flow. Accordingly, the real option of abandonment is preferable if the Year 1 cash flow is $2 million. The $3 million salvage value exceeds the expected value of the Year 2 cash flows discounted to the end of Year 1 in this case only. If the real option of abandonment is exercised only when Year 1 cash flows equal $2 million, the expected value of the cash flows at the end of Year 1 is $4.9 million \( [(3 \times ($2 \text{ million} + $3 \text{ million salvage})] + (4 \times $4 \text{ million}) + (3 \times $6 \text{ million}) \), and the present value of this amount is $4,454,100 \( (.909 \times $4.9 \text{ million}) \). The expected value of the cash flows at the end of Year 2 if the real option is exercised only when Year 1 cash flows equal $2 million is $3,325,000 \( (3 \times 1.0 \times $0) + (4 \times .25 \times $6.4 \text{ million}) + (4 \times .75 \times $3.2 \text{ million}) + (3 \times .4 \times $6.875 \text{ million}) + (.3 \times .6 \times $5 \text{ million}) \), and the present value of this amount is $2,746,450 \( (.826 \times 3,325,000) \). Consequently, the NPV with an abandonment option is $1,200,550 \( ($4,454,100 + $2,746,450 – $6 \text{ million initial outlay}) \). This amount is substantially greater than the NPV with no abandonment option.
- Answer (C) is incorrect because The amount of $2,746,450 equals the expected present value of the Year 2 cash flows.
- Answer (D) is incorrect because The amount of $4,454,100 equals the expected present value of the Year 1 cash flows.

Which of the following is not an example of a real option in a capital budgeting decision?

A. Abandonment.  
B. Follow-up investment.  
C. Option to wait and learn.  
D. Risk-adjusted discount rates.

- Answer (A) is incorrect because Abandonment is an example of a real option.
- Answer (B) is incorrect because Follow-up investment is an example of a real option.
- Answer (C) is incorrect because The option to wait and learn is an example of a real option.
- Answer (D) is correct. Real options include such factors as the ability to abandon the project early, the opportunity for follow-up investments or ability to create new products, the ability to base additional cash outflows on a wait-and-learn opportunity, or the option to change capacity during the project. Risk-adjusted discount rates are not real options but are a form of sensitivity analysis.