

## Solution

- A. Incorrect because a composite should be used, not a single representative account. According to the Standard relating to performance presentation, members and candidates can also meet their obligations under the Standard by presenting the performance of the weighted composite of similar portfolios rather than using a single representative account.
- B. **Correct** because according to the Standard relating to performance presentation, members and candidates can also meet their obligations under the Standard by maintaining the data and records used to calculate the performance being presented.
- C. Incorrect because terminated accounts should be included, not excluded. According to the Standard relating to performance presentation, members and candidates can also meet their obligations by including terminated accounts as part of performance history with a clear indication of when the accounts were terminated.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

## Solution

- A. Incorrect because according to Standard III (E), Preservation of Confidentiality, the member must keep information about current, former, and prospective clients confidential.
- B. Incorrect because according to Standard III (E), Preservation of Confidentiality, the member must keep information about current, former, and prospective clients confidential.
- C. **Correct** because according to Standard III (E), Preservation of Confidentiality, members and candidates must keep information about current, former, and prospective clients confidential unless:
  1. The information concerns illegal activities on the part of the client;
  2. Disclosure is required by law; or
  3. The client or prospective client permits disclosure of the information.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. Incorrect because Jacobs violated Standard VI(C), Referral Fees.
- B. Correct** because according to Standards VI(C), Referral Fees, appropriate disclosure means that members and candidates must advise the client or prospective client, before entry into any formal agreement for services, of any benefit given or received for the recommendation of any services provided by the member or candidate. In addition, the member or candidate must disclose the nature of the consideration or benefit —for example, flat fee or percentage basis, one-time or continuing benefit, based on performance, benefit in the form of provision of research or other noncash benefit— together with the estimated dollar value. Jacobs does not provide the estimated dollar value and violates Standard VI(C). Amari provides information to her clients detailing the nature and estimated dollar value before signing the agreement and does not violate Standard VI(C).
- C. Incorrect because only Jacobs violated Standard VI(C), Referral Fees.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

## Solution

- A. Incorrect because this statement can be included in the ad. The charter can be considered a key asset and indicates that her firm holds the charter in high regard. This statement does not misrepresent or exaggerate the meaning or implication of holding the CFA designation.
- B. Incorrect because this statement can be included in the ad and simply indicates that her firm holds the charter in high regard. This statement does not misrepresent or exaggerate the meaning or implication of holding the CFA designation.
- C. **Correct** because the ad should not include this statement. The Standard relating to references to CFA Institute, the CFA Designation, and the CFA Programs states that when referring to CFA Institute, CFA Institute membership, the CFA designation, or candidacy in the CFA Program, members and candidates must not misrepresent or exaggerate the meaning or implications of membership in CFA Institute, holding the CFA designation, or candidacy in the CFA Program. CFA charterholders are those individuals who have earned the right to use the CFA designation granted by CFA Institute. These individuals have satisfied certain requirements, including completion of the CFA Program and the required years of acceptable work experience. It would not have been a violation to simply state that Ms. Bryce had consecutively passed all three levels of the exam; it would simply be a statement of fact. Adding that it places her in an elite group is an exaggeration of her accomplishment and could be viewed as misleading.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- Solution
- A. Incorrect because the advertisement misrepresents the size of Barrett's client base.
  - B. **Correct** because Barrett's client base is made up of a small number of large institutions so stating in the advertisement that his client base is a larger number is a misrepresentation and a violation of the Standard I(C), Misrepresentation.
  - C. Incorrect because this Standard has not been violated.

#### Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- A. Incorrect because verification is recommended, not required, and is performed to test the process with respect to an entire firm, not on specific composites or a sample of composites.
- B. Correct** because firms claiming compliance with the GIPS standards are responsible for their claim of compliance and for maintaining that compliance — that is, firms self-regulate their claim of compliance.
- C. Incorrect because verification by a third party, not the firm, provides the assurance as to whether the firm's policies and procedures related to composite and pooled fund maintenance, as well as the calculation, presentation, and distribution of performance, have been designed in compliance with the GIPS standards and have been implemented on a firm-wide basis.

## Introduction to the Global Investment Performance Standards (GIPS)

- describe the key concepts of the GIPS Standards for Firms

- A. **Correct** because the objectives of the GIPS standards are include promoting investor interests and instilling investor confidence.
- B. Incorrect because the objectives of the GIPS standards include promoting fair, global competition among investment firms, not just fair local competition among investment firms.
- C. Incorrect because the objectives of the GIPS standards include obtaining worldwide acceptance of a single standard for calculating and presenting performance, not a small number of standards.

### Introduction to the Global Investment Performance Standards (GIPS)

- explain why the GIPS standards were created, who can claim compliance, and who benefits from compliance

## Solution

- A. Incorrect because Hussein did not likely act with competence and diligence as required by the Standard relating to diligence and reasonable basis. One hour of preparation with regard to Islamic investment products would not likely be considered sufficient to give investment advice to pension plan trustees.
- B. Incorrect because it is not likely she violated the Standard relating to misconduct, i.e., conduct involving dishonesty, fraud, and/or deceit by stating she is an expert in retirement planning and investments.
- C. **Correct** because Hussein did not likely act with competence and diligence as required by the Standard relating to diligence and reasonable basis. One hour of preparation with regard to Islamic investment products would not likely be considered sufficient to give investment advice to pension plan trustees. Misconduct was not violated by Hussein stating she is an expert in retirement planning and investments because this is the area she specializes in.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- A. Incorrect because according to the GIPS standards, once a firm claims compliance with the Standards, they may voluntarily hire an independent third party to perform a verification in order to increase confidence in the firm's claim of compliance. Verification is voluntary, it is not a requirement.
- B. **Correct** because according to the GIPS standards, a firm is required to initially present, at a minimum, five years of annual investment performance that is compliant with the GIPS standards. If the firm or the composite has been in existence less than five years, the firm must present performance since the firm's inception or the composite inception date.
- C. Incorrect because according to the GIPS standards, a composite must include all actual, fee-paying, discretionary portfolios managed in accordance with the same investment mandate, objective, or strategy. Composites do not include non-discretionary accounts.

## Introduction to the Global Investment Performance Standards (GIPS)

- describe the fundamentals of compliance, including the recommendations of the GIPS standards with respect to the definition of the firm and the firm's definition of discretion

- A. Incorrect because according to the Standard relating to suitability, the member is not required to determine the suitability of the fund for investors in the fund.
- B. **Correct** because according to the Standard relating to suitability, some members and candidates do not manage money for individuals but are responsible for managing a fund to an index or an expected mandate. The responsibility of these members and candidates is to invest in a manner consistent with the stated mandate. Members and candidates who manage pooled assets to a specific mandate are not responsible for determining the suitability of the fund as an investment for investors who may be purchasing shares in the fund. The responsibility for determining the suitability of an investment for clients can be conferred only on members and candidates who have an advisory relationship with clients.
- C. Incorrect because according to the Standard relating to suitability, the member is not required to determine the suitability of the fund for investors.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. Incorrect because the Standard relating to market manipulation is not intended to preclude transactions undertaken on legitimate trading strategies based on perceived market inefficiencies. Therefore, using public information to implement trading strategies to exploit perceived market inefficiencies is not an example of information-based manipulation.
- B. **Correct** because according to the Standard relating to market manipulation, information-based manipulation includes spreading false rumors to induce trading by others. In this case, the member spreads a false rumor by issuing overly optimistic projections to induce other market participants to trade a security; therefore, the member engages in information-based manipulation.
- C. Incorrect because according to the Standard relating to market manipulation, information-based manipulation includes, but is not limited to, spreading false rumors to induce trading by others. The member relies on the false rumors existing in the market instead of spreading it. Therefore, she does not engage in information-based manipulation.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. Incorrect because according to Standard III (B), members and candidates must deal fairly and objectively with all clients when providing investment analysis, making investment recommendations, taking investment action, or engaging in other professional activities. Tam has treated all his clients invested in the fund the same and has therefore not violated Standard III (B).
- B. **Correct** because according to Standard V(B), members must disclose to clients and prospective clients the basic format and general principles of the investment processes they use to analyze investments, select securities, and construct portfolios and must promptly disclose any changes that might materially affect those processes. Even if the fund's returns have improved and the options have expired, Tam does not mention the options in his next client update and has therefore violated Standard V(B).
- C. Incorrect because according to Standard III (B), members and candidates must deal fairly and objectively with all clients when providing investment analysis, making investment recommendations, taking investment action, or engaging in other professional activities. Tam has treated all his clients invested in the fund the same and has therefore not violated Standard III (B).

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. Incorrect because Standard VII(A) does not cover expressing opinions regarding CFA Institute, the CFA Program, or other CFA Institute programs. Members and candidates are free to disagree and express their disagreement with CFA Institute on its policies, its procedures, or any advocacy positions taken by the organization. So, Comment 1 does not violate the Standard as it reflects Raman's opinion.
- B. **Correct** because according to Standard VII(A), Conduct as Participants in CFA Institute Programs, when expressing a personal opinion, a candidate is prohibited from disclosing content-specific information, including any actual exam question and the information as to subject matter covered or not covered in the exam. In making Comment 2, Raman may have provided information on the subject matter covered and hence violated the Standard.
- C. Incorrect because "Standard VII(A) does not cover expressing opinions regarding CFA Institute, the CFA Program, or other CFA Institute programs. Members and candidates are free to disagree and express their disagreement with CFA Institute on its policies, its procedures, or any advocacy positions taken by the organization. So, Comment 1 does not violate the Standard as it reflects Raman's opinion. However, in making Comment 2, Raman may have provided information on the subject matter covered on the exam and hence violated the Standard."

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. Incorrect because as opposed to ethical conduct, legal conduct is based on legal requirements that are typically narrow in scope. Regulators' and legislatures' responses typically take significant time, during which the problematic practice may continue or even become more common. Once enacted, a new regulation or law may be vague, conflicting, or too narrow in scope.
- B. Incorrect because legal conduct, as opposed to ethical conduct, typically follows market practices. Regulators may proactively design laws and regulations to address existing or anticipated practices that may adversely affect the fairness and efficiency of markets or reactively design laws and regulations in response to a crisis.
- C. **Correct** because ethical conduct typically considers and provides benefits to multiple stakeholders. Ethical conduct requires actively considering the interests of all stakeholders and tries to benefit multiple stakeholders, including clients, employers, and all market participants, and minimizes risks.

## Ethics and Trust in the Investment Profession

- explain professionalism in investment management

A. **Correct** because according to Standard I(D), Misconduct, the Code and Standards are primarily aimed at conduct and actions related to a member's or candidate's professional life. Personal bankruptcy may not reflect on the integrity or trustworthiness of the person declaring bankruptcy, but if the circumstances of the bankruptcy involve fraudulent or deceitful business conduct, the bankruptcy may be a violation of this standard. Therefore, Action 1 is not a violation of Standard I(D).

In addition, according to Standard V(A), Diligence and Reasonable Basis, even though an investment recommendation may be well informed, downside risk remains for any investment. Members and candidates can base their decisions only on the information available at the time decisions are made. The steps taken in developing a diligent and reasonable recommendation should minimize unexpected downside events. Therefore, Action 2 is not a violation of Standard V(A), Diligence and Reasonable Basis.

B. Incorrect because according to Standard I(D), Misconduct, the Code and Standards are primarily aimed at conduct and actions related to a member's or candidate's professional life. Personal bankruptcy may not reflect on the integrity or trustworthiness of the person declaring bankruptcy, but if the circumstances of the bankruptcy involve fraudulent or deceitful business conduct, the bankruptcy may be a violation of this standard. Therefore, Action 1 is not a violation of Standard I(D).

C. Incorrect because neither Action 1 nor Action 2 violate the Standards, as explained in the justification for the correct answer.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. **Correct** because according to Standard IV(A), Loyalty, in matters related to their employment, members and candidates must act for the benefit of their employer and not deprive their employer of the advantage of their skills and abilities, divulge confidential information, or otherwise cause harm to their employer. Statement 2 is incorrect because the standard does not require members and candidates to subordinate important personal and family obligations to their work. Statement 3 is incorrect because the standard does not preclude members or candidates from entering into an independent business while still employed (but does state members and candidates who plan to engage in independent practice for compensation must notify their employer). Therefore, only Statement 1 is correct.
- B. Incorrect because Standard IV(A) does not require members and candidates to subordinate important personal and family obligations to their work.
- C. Incorrect because Standard IV(A) does not preclude members or candidates from entering into an independent business while still employed.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. Incorrect because even though the company does not have a stock pre-clearance procedure, trading the stock of a company the analyst recommended as an acquisition candidate is an act which violates the Standard relating to loyalty, as she did not give her employer the opportunity to take advantage of her skill/recommendation prior to buying the shares for her own portfolio.
- B. Incorrect because there has been a violation of the Standard relating to priority of transactions, which requires that investment transactions for clients and employers must have priority over investment transactions in which a Member or Candidate is the beneficial owner despite the fact that there are no stock pre-clearance procedures at Bowron.
- C. **Correct** because there is no indication the analyst had access to material nonpublic information and was in violation of the Standard relating to material nonpublic information. Specifically, Tucker did not have information concerning any decision by Bowron to acquire Hanchin stock. The analyst had indicated numerous companies were viable options for takeover, and she did not single out any one company in particular.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- A. Incorrect because the recommended procedures for compliance with the Standard relating to disclosure of conflicts do not include reporting the matter to CFA Institute.
- B. Correct** because according to the recommended procedures for compliance with the Standard relating to disclosure of conflicts, members or candidates should disclose special compensation arrangements with the employer that might conflict with client interests. If the member's or candidate's firm does not permit such disclosure, the member or candidate should document the request and may consider dissociating from the activity. There is no requirement to report the matter to CFA Institute.
- C. Incorrect because the recommended procedures for compliance with the Standard relating to disclosure of conflicts do not include reporting the matter to CFA Institute.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- A. **Correct** because according to the GIPS standards, verification is performed with respect to an entire firm, not on specific composites.
- B. Incorrect because according to the GIPS standards, once a firm claims compliance with the standards, they may voluntarily hire an independent third party to perform a verification in order to increase confidence in the firm's claim of compliance.
- C. Incorrect because verification must be performed by an independent third party. A firm cannot perform its own verification.

## Introduction to the Global Investment Performance Standards (GIPS)

- describe the concept of independent verification

- A. Incorrect because according to the Standard relating to record retention, local regulators often impose requirements on members, candidates, and their firms related to record retention that must be followed. In this case records should be maintained for six years, in accordance with the regulatory requirement. The maturity of the bonds is irrelevant for the record keeping requirement.
- B. **Correct** because according to the Standard relating to record retention, local regulators often impose requirements on members, candidates, and their firms related to record retention that must be followed. In the absence of regulatory guidance or firm policies, CFA Institute recommends maintaining records for at least seven years. In this case records should be maintained for six years, in accordance with the regulatory requirement.
- C. Incorrect because according to the Standard relating to record retention, local regulators often impose requirements on members, candidates, and their firms related to record retention that must be followed. In this case records should be maintained for six years, in accordance with the regulatory requirement.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. **Correct** because the analyst has dealt fairly with all clients by sending them an email and posting his rating change on the credit rating agency's website when making material changes to his prior investment recommendation; therefore, he has not violated the Standard relating to fair dealing. Clients should be treated fairly when material changes in a member's or candidate's prior investment recommendations are disseminated, which has been done.
- B. Incorrect because the analyst does not have a reasonable or adequate basis for his downgrade, as required by the Standard relating to diligence and reasonable basis.
- C. Incorrect because the analyst has used the release of a competitor's report, contrary to his own previously published report, as a reason to revise his recommendation and has not used reasonable judgment in identifying which factors are important to his investment analyses, recommendations, or actions, as required by Standard relating to communication with clients and prospective clients.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

## Solution

- A. Incorrect because according to the Standard relating to loyalty, prudence, and care, the duty of loyalty is owed to the ultimate beneficiaries of the pension plan, not the company.
- B. Correct** because according to the Standard relating to loyalty, prudence, and care, when the manager is responsible for the portfolios of pension plans or trusts, the client is not the person or entity who hires the manager but, rather, the beneficiaries of the plan or trust. The duty of loyalty is owed to the ultimate beneficiaries.
- C. Incorrect because according to the Standard relating to loyalty, prudence, and care, the duty of loyalty is owed to the ultimate beneficiaries of the pension plan, not the company.

## Guidance for Standards I–VII

- demonstrate the application of the Code of Ethics and Standards of Professional Conduct to situations involving issues of professional integrity

- A. **Correct** because Standard I(A) requires members and candidates to understand applicable laws and regulations in those countries where they trade or conduct business. While an understanding of laws and regulations is required, members and candidates can rely on legal counsel and compliance to be subject matter experts in these areas.
- B. Incorrect because Standard I(A) does require members and candidates to become legal experts. While an understanding of laws and regulations is required, members and candidates can rely on legal counsel and compliance to be subject matter experts in these areas.
- C. Incorrect because members and candidates do not have such a requirement under the Standards.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- A. **Correct** because Singh does not violate the Standards. She conducts unrelated non-competitive services to clients outside of business hours and thus does not deprive her employer of the advantage of her skills and abilities, nor is there any indication that she divulges confidential information or otherwise causes harm to her employer. She also does not need to divulge information relating to her additional compensation or to seek permission, as her management consulting services do not create a conflict of interest with her employer's interest.
- B. Incorrect because Singh conducts unrelated non-competitive services to clients outside of business hours and thus does not deprive her employer of the advantage of her skills and abilities, nor is there any indication that she divulges confidential information or otherwise causes harm to her employer.
- C. Incorrect because she does not need to divulge information relating to her additional compensation or to seek permission, as her management consulting services do not create a conflict of interest with her employer's interest.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- A. **Correct** because according to the Standard relating to responsibilities of supervisors, if the member or candidate clearly cannot discharge supervisory responsibilities because of the absence of a compliance system or because of an inadequate compliance system, the member or candidate should decline in writing to accept supervisory responsibility. Therefore, Ash has not violated the Standard by declining in writing. In addition, the Standard relating to loyalty, prudence and care states that members and candidates have a duty of loyalty to their clients and must act with reasonable care and exercise prudent judgment. Ash has not violated this Standard because clients are not mentioned in this question.
- B. Incorrect because the Standard relating to loyalty, prudence and care, has not been violated because there is no reference to clients in the question.
- C. Incorrect because the Standard relating to responsibilities of supervisors, has not been violated because Ash declined the supervisory role in writing.

## Guidance for Standards I–VII

- identify conduct that conforms to the Code and Standards and conduct that violates the Code and Standards

- A. Incorrect because it is not clear selling a fixed percentage of all liquid stocks would be an investment action consistent with the stated objectives and constraints of each client's portfolio. Thus, Bergeron *most likely* violated Standard III(C), Suitability.
- B. **Correct** because the manager gives instructions to sell his personal holdings after those of his clients, so there is no indication that a violation of Standard VI(B), Priority of Transactions, occurred.
- C. Incorrect because the decision by the manager to conduct an across the board sale of liquid stocks does not appear to have a reasonable and adequate basis nor to be supported by appropriate research and investigation. This action appears to be motivated by the manager's interest in getting back to his golf game rather than any investment rationale. Thus, Bergeron most likely violated Standard V(A), Diligence and Reasonable Basis.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

## Solution

- A. Incorrect because Lin discloses the activities to Dynasty's compliance department.
- B. **Correct** because Lin is placing himself in a situation where his objectivity or appearance of objectivity may be compromised, which is a violation of the Standard relating to independence and objectivity. It would have been more advisable for Lin to decline having Titan pay for this trip.
- C. Incorrect because participating in this trip does not prevent Lin from performing the required analysis to make an informed investment decision.

## Guidance for Standards I–VII

- recommend practices and procedures designed to prevent violations of the Code of Ethics and Standards of Professional Conduct

- A. **Correct** because when policy rates are above the neutral rate, monetary policy is contractionary. The Neutral rate = Trend growth + Inflation target =  $2\% + 2\% = 4\%$ , which is less than 5%. Therefore, a policy rate of 5% is contractionary.
- B. Incorrect because the neutral policy rate for any economy comprises two components: real trend rate of growth of the underlying economy, and long-run expected inflation. In this case the neutral rate is  $2\% + 2\% = 4\%$ .
- C. Incorrect because the neutral policy rate for any economy comprises two components: real trend rate of growth of the underlying economy, and long-run expected inflation. When policy rates are below the neutral rate, monetary policy is expansionary. In this case the neutral rate is  $2\% + 2\% = 4\%$ , which is less than 5%. Therefore, a policy rate of 5% is contractionary and not expansionary.

## Monetary Policy

- describe qualities of effective central banks; contrast their use of inflation, interest rate, and exchange rate targeting in expansionary or contractionary monetary policy; and describe the limitations of monetary policy

- A. Incorrect because the inventory valuation method used is unrelated to the liquidity of the inventory.
- B. Incorrect because the amount of inventories expensed as cost of goods sold has no effect on the liquidity of the inventory on hand.
- C. **Correct** because the breakdown between work in progress and finished goods provides liquidity information because finished goods are ready to ship and thus more liquid than work in progress.

## Analysis of Inventories

- describe the presentation and disclosures relating to inventories and explain issues that analysts should consider when examining a company's inventory disclosures and other sources of information

- Solution
- A. Incorrect because deforestation is an environmental issue, not a social issue.
  - B. **Correct** because social factors considered in ESG implementation generally pertain to the management of the human capital of a business. Labor standards are a social issue.
  - C. Incorrect because bribery and corruption are a governance issue, not a social issue.

## Investors and Other Stakeholders

- describe environmental, social, and governance factors of corporate issuers considered by investors

- A. **Correct** because DSO = 365 / accounts receivables turnover; or = 365 / 12 ≈ 30 days, where the receivables turnover = revenue / average receivables; or = 2,400 / [(240 + 160) / 2] = 2,400 / 200 = 12.
- B. Incorrect because it is 365 divided by the ratio of average sales to average receivables; or = 365 / [(2,400 + 2,000) / 2] / [(240 + 160) / 2] = 365 / (2,200 / 200) = 365 / 11 ≈ 33 days.
- C. Incorrect because it is 365 divided by the ratio of cost of sales to average accounts receivable; or = 365 / [1,800 / [(240 + 160) / 2]] = 365 / (1,800 / 200) = 365 / 9 ≈ 41 days.

## Financial Analysis Techniques

- calculate and interpret activity, liquidity, solvency, and profitability ratios

- A. Incorrect because it is only at the point when all performance obligations have been met except for payment that a receivable appears on the seller's balance sheet.
- B. Correct** because revenue is recognized when a performance obligation is fulfilled. When revenue is recognized, a contract asset is presented on the balance sheet. It is only at the point when all performance obligations have been met except for payment that a receivable appears on the seller's balance sheet.
- C. Incorrect because when revenue is recognized, a contract asset is presented on the balance sheet. Also, if consideration is received in advance of transferring good(s) or service(s), the seller presents a contract liability.

## Analyzing Income Statements

- describe general principles of revenue recognition, specific revenue recognition applications, and implications of revenue recognition choices for financial analysis

- A. Incorrect because at this early stage, debt capital is typically not available or available but very expensive. Most lenders require stable and positive cash flow to service debt and/or collateral to secure it. An early-stage company often has neither, making it a high-risk prospect to lenders.
- B. Incorrect because while debt is used at this stage it is less than that of the mature stage. Many growth companies use debt conservatively in order to preserve operational and financial flexibility and minimize the risk of financial distress. Equity remains the predominant source of capital.
- C. **Correct** because a mature company becomes able to support low-cost debt, often on an unsecured basis. From the company's perspective, debt financing is likely to be more attractive than higher-cost equity financing. In practice, large, mature public companies commonly employ significant leverage, although many seek to maintain an investment-grade rating in order to preserve maximum financial flexibility.

## Capital Structure

- explain factors affecting capital structure and the weighted-average cost of capital

## Solution

- A. Incorrect because it multiplies the cost of equity by 1 minus the tax rate.  $\text{WACC} = w_d \times r_d \times (1 - t) + w_e \times r_e \times (1 - t)$   
 $= 40\% \times 5.1\% \times (1 - 25\%) + 60\% \times 9.8\% \times (1 - 25\%) = 5.94\% \approx 5.9\%$ .
- B. **Correct** because the  $\text{WACC} = w_d \times r_d \times (1 - t) + w_e \times r_e = 40\% \times 5.1\% \times (1 - 25\%) + 60\% \times 9.8\% = 7.41\% \approx 7.4\%$ .
- C. Incorrect because it uses the pre-tax cost of debt, not the after-tax cost of debt.  $\text{WACC} = w_d \times r_d + w_e \times r_e = 40\% \times 5.1\% + 60\% \times 9.8\% = 7.92\% \approx 7.9\%$ .

## Capital Structure

- calculate and interpret the weighted-average cost of capital for a company

A. **Correct** because  $ROE = \text{Net profit margin} \times \text{Total asset turnover} \times \text{Financial leverage} = (\text{Net income} / \text{Revenue}) \times (\text{Revenue} / \text{Average total assets}) \times (\text{Average total assets} / \text{Average shareholders' equity}) = (60,000 / 1,000,000) \times (1,000,000 / 1,500,000) \times 2.0 = 0.06 \times 0.66 \times 2.0 = 0.08 = 8\%.$

Alternatively,  $ROE = ROA \times \text{Financial leverage} = (\text{Net income} / \text{Average total assets}) \times \text{Financial leverage} = (60,000 / 1,500,000) \times 2.0 = 0.04 \times 2.0 = 0.08 = 8\%.$

Alternatively,  $\text{Financial leverage} = \text{Average total assets} / \text{Average shareholders' equity}$ ; or  $\text{Average shareholders' equity} = \text{Average total assets} / \text{Financial leverage} = 1,500,000 / 2 = 750,000$ . Thus,  $ROE = \text{Net income} / \text{Average shareholders' equity}$  or  $60,000 / 750,000 = 0.08 = 8\%$ .

B. Incorrect because EBIT margin instead of Net profit margin is used in the calculation of ROE:  $(EBIT / \text{Revenue}) \times (\text{Revenue} / \text{Average total assets}) \times \text{Financial leverage} = (90,000 / 1,000,000) \times (1,000,000 / 1,500,000) \times 2 = 0.09 \times 0.66 \times 2.0 = 0.12 = 12\%.$

C. Incorrect because the total asset turnover ratio is inverted in the calculation of ROE:  $ROE = (\text{Net income} / \text{Revenue}) \times (\text{Average total assets} / \text{Revenue}) \times \text{Leverage} = (60,000 / 1,000,000) \times (1,500,000 / 1,000,000) \times 2$ ; or  $= 0.06 \times 1.5 \times 2.0 = 0.18 = 18\%.$

## Financial Analysis Techniques

- demonstrate the application of DuPont analysis of return on equity and calculate and interpret effects of changes in its components

- A. Incorrect because the risk committee assists the board in determining the risk policy, profile, and appetite of the company. The risk committee is normally focused on the risk management functions of the company rather than regulatory compliance throughout the company.
- B. Incorrect because the audit committee plays a key role in overseeing the audit and control systems at the company and ensuring their effectiveness. In this regard, the committee monitors the financial reporting process, including the application of accounting policies. The audit committee is normally focused on the financial aspects of the company rather than regulatory compliance throughout the company.
- C. **Correct** because the governance committee monitors the implementation of the governance policies and standards as well as the compliance with the applicable laws and regulations throughout the company.

## Corporate Governance: Conflicts, Mechanisms, Risks, and Benefits

- describe corporate governance and mechanisms to manage stakeholder relationships and mitigate associated risks

- A. **Correct** because the accounting for lessors is identical under IFRS and US GAAP. Under both accounting standards, lessors classify leases as finance or operating leases, which determines the financial reporting. At finance lease inception, the lessor recognizes a lease receivable asset equal to the present value of future lease payments and de-recognizes the leased asset, simultaneously recognizing any difference as a gain or loss.
- B. Incorrect because the accounting for lessors is identical under IFRS and US GAAP. When accounting for an operating lease, because the contract is essentially a rental agreement, the lessor keeps the leased asset on its books and recognizes lease revenue on a straight-line basis.
- C. Incorrect because the accounting for lessors is identical under IFRS and US GAAP. Under both accounting standards, lessors classify leases as finance or operating leases, which determines the financial reporting. At finance lease inception, the lessor recognizes a lease receivable asset equal to the present value of future lease payments and de-recognizes the leased asset, simultaneously recognizing any difference as a gain or loss. The accounting treatment for an operating lease is different in that, because the contract is essentially a rental agreement, the lessor keeps the leased asset on its books and recognizes lease revenue on a straight-line basis.

## Topics in Long-Term Liabilities and Equity

- explain the financial reporting of leases from the perspectives of lessors and lessees

- A. Incorrect. The forward rate does not predict the direction of real interest rates.
- B. Incorrect. The euro, which is the base currency, is trading at a premium to its forward rate. The positive forward points indicate that the euro forward rate is above the spot rate. The US dollar, which is the price currency, is trading at a discount to its forward rate.
- C. **Correct.** A positive forward premium indicates that the interest rates in the base currency region (eurozone) are lower than the interest rates in the price currency region (United States).

## Exchange Rate Calculations

- explain the arbitrage relationship between spot and forward exchange rates and interest rates, calculate a forward rate using points or in percentage terms, and interpret a forward discount or premium

## Solution

### A. Incorrect because impairment loss is higher under IFRS than GAAP.

Under IFRS, the company would compare the carrying amount (€20,000) with the higher of its fair value less costs to sell (€16,000) and its value in use (€17,000). The carrying amount exceeds the value in use, the higher of the two amounts, by €3,000. The machine would be written down to the recoverable amount of €17,000, and an impairment loss of €3,000 would be reported in the income statement. The carrying amount of the machine is now €17,000.

Under US GAAP, the carrying amount (€20,000) is compared with the undiscounted expected future cash flows (€19,000). The carrying amount exceeds the undiscounted expected future cash flows, so the carrying amount is considered not recoverable. The machine would be written down to fair value of €18,000 and an impairment loss of €2,000 would be reported in the income statement. The carrying amount of the machine is now €18,000.

### B. Incorrect because impairment loss is higher under IFRS than GAAP.

Under IFRS, the company would compare the carrying amount (€20,000) with the higher of its fair value less costs to sell (€16,000) and its value in use (€17,000). The carrying amount exceeds the value in use, the higher of the two amounts, by €3,000. The machine would be written down to the recoverable amount of €17,000, and an impairment loss of €3,000 would be reported in the income statement. The carrying amount of the machine is now €17,000.

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### C. Correct because impairment loss is higher under IFRS than GAAP.

Under IFRS, the company would compare the carrying amount (€20,000) with the greater of its fair value less costs to sell (€16,000) and its value in use (€17,000). The carrying amount exceeds the value in use, the higher of the two amounts, by €3,000. The machine would be written down to the recoverable amount of €17,000, and an impairment loss of €3,000 would be reported in the income statement. The carrying amount of the machine is now €17,000.

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## Analysis of Long-Term Assets

- explain and evaluate how impairment and derecognition of property, plant, and equipment and intangible assets affect the financial statements and ratios

- A. **Correct** because companies with comparatively high asymmetry in information include those with complex products, high-tech companies, companies with little transparency in financial accounting information.
- B. Incorrect because companies with comparatively high asymmetry in information include those with lower, not high, levels of institutional ownership.
- C. Incorrect because providers of both debt and equity capital demand higher risk premiums and returns from companies with higher asymmetry in information because there is greater potential for conflicts of interest.

## Corporate Governance: Conflicts, Mechanisms, Risks, and Benefits

- describe the principal-agent relationship and conflicts that may arise between stakeholder groups

## Solution

- A. **Correct** because the CAD/AUD cross-rate = CAD/USD × (AUD/USD)<sup>-1</sup> = 1.2930 / 1.3245 ≈ 0.9762.
- B. Incorrect because the rates are inversely divided; AUD/USD / CAD/USD = 1.3245 / 1.2930 ≈ 1.0244.
- C. Incorrect because the rates are incorrectly multiplied; CAD/USD × AUD/USD = 1.2930 × 1.3245 ≈ 1.7126.

## Exchange Rate Calculations

- calculate and interpret currency cross-rates

- A. **Correct** because the  $F$ -distributed test statistic is constructed by using the sum of squares regression and the sum of squares error, each adjusted for degrees of freedom. In other words, it is the ratio of two variances. The  $F$ -distributed test statistic is  $F = \text{MSR}/\text{MSE}$ , where the mean square regression (MSR) is the same as the sum of squares regression and the mean square error (MSE) is the sum of squares error divided by the degrees of freedom.
- B. Incorrect because the  $F$ -distributed test statistic is  $F = \text{MSR}/\text{MSE}$ , where the MSR = mean square regression and MSE = mean square error. The sum of squares total (SST) does not enter into the F-statistic calculation.
- C. Incorrect because it describes the coefficient of determination, not the  $F$ -statistic. Coefficient of determination = Sum of squares regression/Sum of squares total.

## Simple Linear Regression

- calculate and interpret measures of fit and formulate and evaluate tests of fit and of regression coefficients in a simple linear regression

## Solution

- A. Incorrect because it assumes financial leverage = average total equity / average total assets =  $50 / 150 \approx 0.33$ .
- B. Incorrect because it assumes financial leverage = average total equity / (average total assets – average total equity); or average total equity / average total liabilities =  $50 / 100 = 0.50$ .
- C. **Correct** because financial leverage = average total assets / average total equity =  $150 / 50 = 3.00$ .

## Financial Analysis Techniques

- calculate and interpret activity, liquidity, solvency, and profitability ratios

- A. Incorrect because a single provider of a good or service is representative of a monopoly, not an oligopoly. In pure monopoly markets, there are no other good substitutes for the given product or service. There is a single seller, which, if allowed to operate without constraint, exercises considerable power over pricing and output decisions.
- B. Incorrect because one or many providers of a good or service is representative of both monopolistic competition and perfect competition, not an oligopoly. Monopolistic competition is also highly competitive. The competitive characteristic is a notably large number of firms. Similarly, perfect competition is a reality—for example, in several commodities markets, where sellers and buyers have a strictly homogeneous product and no single producer is large enough to influence market prices. Product differentiation is not possible.
- C. **Correct** because the oligopoly market structure is based on a relatively small number of firms supplying the market.

## The Firm and Market Structures

- identify the type of market structure within which a firm operates and describe the use and limitations of concentration measures

- A. Incorrect because it reverses the direction of all four adjustments:  $2,000 + 1,000 - 6,000 - 4,000 = -7,000$ .
- B. Incorrect because it adds amortization of bond premium and subtracts the increase in deferred tax liability while the reverse is true:  $2,000 - 1,000 - 6,000 + 4,000 = -1,000$ .
- C. **Correct** because the indirect method shows how cash flow from operations can be obtained from reported net income as the result of a series of adjustments. The indirect format begins with net income. To reconcile net income with operating cash flow, adjustments are made for non-cash items, for non-operating items, and for the net changes in operating accruals. As such, amortization of bond premium is a non-cash item which is subtracted from net income, gain on sale of assets is a non-operating item which is subtracted from net income, increase in deferred income tax liability is added back to net income, and increase in unearned revenue is a net change in an operating accrual which is added back to net income:  $-2,000 - 1,000 + 6,000 + 4,000 = 7,000$ .

## Analyzing Statements of Cash Flows I

- describe the steps in the preparation of direct and indirect cash flow statements, including how cash flows can be computed using income statement and balance sheet data

- A. **Correct** because the continuously compounded return associated with a holding period is the natural logarithm of 1 plus that holding period return, or equivalently, the natural logarithm of the ending price over the beginning price (the price relative). The ending price is  $\$100 - \$100 \times 0.45 = \$55$ . Therefore, the price relative is  $\frac{\$55}{\$100} = .55$ , and the continuously compounded return is  $\ln(0.55) = -0.5978$ , or  $-60\%$ .
- B. Incorrect because it is the holding period return rather than the continuously compounded return;  
 $\frac{\$55}{\$100} - 1 = .55 - 1 = -.45$ , or  $-45\%$ .
- C. Incorrect because the continuously compounded return is incorrectly calculated as  
 $e^{-0.45} - 1 = 0.6376 - 1 = -0.3624$ , or  $-36\%$ .

## Rates and Returns

- calculate and interpret annualized return measures and continuously compounded returns, and describe their appropriate uses

- A. **Correct** because an inventory write-down reduces both profit and the carrying amount of inventory on the balance sheet and thus has a negative effect on profitability, liquidity, and solvency ratios. However, activity ratios (for example, inventory turnover and total asset turnover) will be positively affected by a write-down because the asset base (denominator) is reduced.
- B. Incorrect because an inventory write-down reduces both profit and the carrying amount of inventory on the balance sheet and thus has a negative effect on profitability, liquidity, and solvency ratios.
- C. Incorrect because an inventory write-down reduces both profit and the carrying amount of inventory on the balance sheet and thus has a negative effect on profitability, liquidity, and solvency ratios.

## Analysis of Inventories

- describe the measurement of inventory at the lower of cost and net realisable value and its implications for financial statements and ratios

- A. Incorrect because with volatile revenue growth from a low base and no debt, this is most likely a company in its start-up phase. At this early stage, debt capital is typically not available.
- B. **Correct** because since the company's revenue is growing steadily (20% in the first year and 22% subsequently) and there is already a small amount of debt in the capital structure, this company is most likely in its growth phase. A company in this phase with less than 10% Debt/Capital likely has the capacity to increase debt.
- C. Incorrect because with negligible revenue growth and Debt/Capital already greater than 25%, this company is most likely a mature company. Mature companies usually use leverage, but a Debt/Capital ratio of 25% means less ability to increase leverage than a company in its growth phase with less debt outstanding.

## Capital Structure

- explain factors affecting capital structure and the weighted-average cost of capital

- A. Incorrect because notes payable (not accounts payable) are financial liabilities owed by a company through a formal loan agreement.
- B. Correct** because accounts payable are amounts that a company owes its vendors for purchases of goods and services. They represent the unpaid amount as of the balance sheet date of the company's purchases on credit.
- C. Incorrect because accounts payable and notes payable due in one year both are current liabilities, which are reported in the current liability section of the balance sheet.

## Analyzing Balance Sheets

- explain the financial reporting and disclosures related to financial instruments

## Solution

- A. Incorrect because bundling refers to combining multiple products or services so that customers are incentivized, or required, to buy them together. Bundling can be effective, particularly for products that are complementary, with high incremental margins and high marketing costs relative to the cost of the product itself.
- B. Incorrect because tiered pricing charges different prices to different buyers, most commonly based on volume purchased. Note that volume discounts achieve a similar result.
- C. **Correct** because penetration pricing is an example of discount pricing and is used when a firm willingly sacrifices margins in order to build scale and market share. Examples include Netflix (subscription video), Huawei (telecom equipment), and Amazon (tablets, e-readers, Alexa speakers).

## Business Models

- describe key features of business models

- A. Incorrect because the demand curve that each perfectly competitive firm faces is a horizontal line at the equilibrium price, not negatively sloped.
- B. **Correct** because the demand curve that each perfectly competitive firm faces is a horizontal line at the equilibrium price.
- C. Incorrect because the demand curve that each perfectly competitive firm faces is a horizontal line at the equilibrium price, not positively sloped.

## The Firm and Market Structures

- explain supply and demand relationships under oligopoly, including the optimal price and output for firms as well as pricing strategy

- A. **Correct** because the marginal cost of debt financing is the cost of debt after considering the allowable deduction for interest on debt. Based on the country's tax law the marginal cost of debt is  $r_d(1 - t)$ . Therefore, if tax rates increase the after-tax cost of debt will decrease.
- B. Incorrect because when interest is deductible, the marginal cost of debt is equal to  $r_d(1 - t)$ . If tax rates increase, the cost of debt will decrease, not remain the same.
- C. Incorrect because the cost of debt would decrease, not increase. The marginal cost of debt financing is the cost of debt after considering the allowable deduction for interest on debt based on the country's tax law. The marginal cost of debt is  $r_d(1 - t)$ .

## Capital Structure

- calculate and interpret the weighted-average cost of capital for a company

- A. Incorrect because autarky describes countries seeking political self-sufficiency with little or no external trade or finance.
- B. Incorrect because hegemonic countries tend to be regional or even global leaders, and they use their political or economic influence of others to control resources. State-owned enterprises tend to control key export markets.
- C. **Correct** because bilateralism is the conduct of political, economic, financial, or cultural cooperation between two countries.

## Introduction to Geopolitics

- describe geopolitics from a cooperation versus competition perspective

- A. Incorrect because data encryption uses cryptography, not natural language processing. Features of DLT (distributed ledger technology) include the use of cryptography—an algorithmic process to encrypt data, making the data unusable if received by unauthorized parties—which enables a high level of network security and database integrity. For example, DLT uses cryptographic methods of proof to verify network participant identity and for data encryption.
- B. **Correct** because NLP (natural language processing) may also be employed in compliance functions to review employee voice and electronic communications for adherence to company or regulatory policy, inappropriate conduct, or fraud or for ensuring private or customer information is kept confidential. Text analytics involves the use of computer programs to analyze and derive meaning typically from large, unstructured text- or voice-based datasets, and within the larger field of text analytics, NLP is an important application.
- C. Incorrect because natural language processing is applied to unstructured data, not structured data. Structured data items can be organized in tables and are commonly stored in a database where each field represents the same type of information.

## Introduction to Big Data Techniques

- describe applications of Big Data and Data Science to investment management

- A. **Correct** because when using a common-sized income statement, each line item, including cost of sales, is stated as a percentage of revenue. Common-size statements facilitate comparison across time periods and across companies because the standardization of each line item removes the effect of size.
- B. Incorrect because common-size analysis of the income statement is performed by stating each line item on the income statement as a percentage of revenue, not net income.
- C. Incorrect because pretax income is most appropriately used in conjunction with the reported amount of taxes to ultimately examine the cause of differences in effective tax rates across companies and project their future amounts of net income.

## Analyzing Income Statements

- evaluate a company's financial performance using common-size income statements and financial ratios based on the income statement

- A. **Correct** because an expansionary policy could include a cut in sales (indirect) taxes to lower prices which raises real incomes with the objective of raising consumer demand.
- B. Incorrect because a cut in the policy rate constitutes an expansionary monetary policy not fiscal policy.
- C. Incorrect because an expansionary policy could include new (not reduced) public spending on social goods and infrastructure, such as hospitals and schools, boosting personal incomes with the objective of raising aggregate demand.

## Fiscal Policy

- explain the implementation of fiscal policy and difficulties of implementation as well as whether a fiscal policy is expansionary or contractionary

- A. Incorrect because this is required under IFRS but not US GAAP. Under IFRS, for each class of intangible assets, why it is considered to have an indefinite life must be disclosed. Under US GAAP, companies are required to disclose the gross carrying amounts and accumulated amortization in total and by major class of intangible assets, the aggregate amortization expense for the period, and the estimated amortization expense for the next five fiscal years.
- B. Incorrect because this is required under IFRS but not US GAAP. Under IFRS, for each class of intangible assets, a company must disclose where amortization is included on the income statement. Under US GAAP, companies are required to disclose the gross carrying amounts and accumulated amortization in total and by major class of intangible assets, the aggregate amortization expense for the period, and the estimated amortization expense for the next five fiscal years.
- C. **Correct** because this is required under US GAAP. Under US GAAP, companies are required to disclose the gross carrying amounts and accumulated amortization in total and by major class of intangible assets, the aggregate amortization expense for the period, and the estimated amortization expense for the next five fiscal years.

## Analysis of Long-Term Assets

- analyze and interpret financial statement disclosures regarding property, plant, and equipment and intangible assets

A. Incorrect because the calculation adds net debt repayment when it should subtract it.

$$\text{¥28,798} = \text{¥28,808} - \text{¥1,300} + \text{¥1,750} - (\text{-¥470} + \text{¥930})$$

B. Incorrect because the calculation does not take into account the net debt repayment.

$$\text{¥29,258} = \text{¥28,808} - \text{¥1,300} + \text{¥1,750}.$$

C. **Correct** because FCFE is the cash flow available to the company's common stockholders after all operating expenses and borrowing costs (principal and interest) have been paid and necessary investments in working capital and fixed capital have been made. FCFE can be computed as

$$\text{FCFE} = \text{CFO} - \text{FCInv} + \text{net borrowing}$$

Where:

CFO = Cash flow from operating activities

FCInv = Capital expenditures (fixed capital, such as equipment)

$$\text{FCFE} = \text{¥28,808} - \text{¥1,300} + \text{¥1,750} - \text{¥470} + \text{¥930} = \text{¥29,718}.$$

## Analyzing Statements of Cash Flows II

- calculate and interpret free cash flow to the firm, free cash flow to equity, and performance and coverage cash flow ratios

- A. Incorrect because in perfect capital markets, a company's leverage does not impact its value.
- B. **Correct** because in perfect capital markets, a company's leverage does not impact its value. Given Modigliani and Miller's assumptions of perfect capital markets—in which there are no taxes, transaction costs, or bankruptcy costs, and in which all investors have equal ("symmetric") information—capital structure does not affect the value of the company and is irrelevant.
- C. Incorrect because in perfect capital markets, a company's leverage does not impact its value.

## Capital Structure

- explain the Modigliani–Miller propositions regarding capital structure

- A. **Correct** because the possibility that fiscal policy can influence output means that it may be an important tool for economic stabilization. In a recession, governments can raise spending (expansionary fiscal policy) in an attempt to raise employment and output. In boom times—when an economy has full employment and wages and prices are rising too fast—then government spending may be reduced and taxes raised (contractionary fiscal policy).
- B. Incorrect because when executing expansionary fiscal policy a government increases (not decreases) the spending.
- C. Incorrect because when executing expansionary fiscal policy a government increases (not decreases) the spending.

## Fiscal Policy

- describe roles and objectives of fiscal policy as well as arguments as to whether the size of a national debt relative to GDP matters

- A. Incorrect because it is not a requirement to provide information about every line item and for many companies, the financial notes and supplemental schedules provide explanatory information about every line item (or almost every line item) on the balance sheet and income statement.
- B. **Correct** because the notes disclose information about the accounting policies, methods, and estimates used to prepare the financial statements.
- C. Incorrect because management highlights are covered by the management commentary or management's discussion and analysis (MD&A) and not the financial notes. Also, in the United States, the SEC requires listed companies to provide an MD&A and specifies the content. Management must highlight any favorable or unfavorable trends and identify significant events and uncertainties that affect the company's liquidity, capital resources, and results of operations.

## Introduction to Financial Statement Analysis

- describe the importance of regulatory filings, financial statement notes and supplementary information, management's commentary, and audit reports

- A. Incorrect because here the lease payments are assumed to be annual ( $= \$6,000 \times 4 = \$24,000$ ) and are then discounted at 6% per year over a 5-year period to give:  $PV = \$24,000 \{ [1 - 1/(1 + 0.06)^5] / 0.06 \} = \$101,096.73 \approx \$101,097$
- B. **Correct** because an ordinary annuity has equal annuity payments, with the first payment starting one period into the future. In total, the annuity makes  $N$  payments, with the first payment at  $t = 1$  and the last at  $t = N$ . We can express the present value of an ordinary annuity as the sum of the present values of each individual annuity payment. Here, the number of quarterly lease payments is  $5 \times 4 = 20$  and the interest rate is  $6\%/4 = 1.5\%$  per quarter, implying a present value  $PV = \$6,000 \{ [1 - 1/(1 + 0.015)^{20}] / 0.015 \} = \$103,011.83 \approx \$103,012$ .
- C. Incorrect because, as stated in the stem, the first payment starts at the end of the first quarter. Response C – \$104,5557 – is calculated by incorrectly assuming the payments start immediately, not one period into the future.

## Time Value of Money in Finance

- calculate and interpret the present value (PV) of fixed-income and equity instruments based on expected future cash flows

A. **Correct** because in a lin-log model, the dependent variable is linear but the independent variable is logarithmic.

The lin-log model takes the form of  $Y_i = b_0 + b_1 \ln X_i$ .

B. Incorrect because this describes a log-lin model, in which the dependent variable is logarithmic but the independent variable is linear.

C. Incorrect because this describes a log-log model, where both the dependent and independent variables are in logarithmic form.

## Simple Linear Regression

- describe different functional forms of simple linear regressions

## Solution

- A. Incorrect because trade credit is a source of primary liquidity. Primary sources of liquidity include short-term funds, which can include items such as trade credit.
- B. Correct** because secondary sources of liquidity include liquidating assets, which depends on the degree to which short-term and/or long-term assets can be liquidated and converted into cash without substantial loss in value.
- C. Incorrect because cash flow management is a source of primary liquidity. Primary sources of liquidity include cash flow management, which is the company's effectiveness in its cash management system and practices, and the degree of decentralization of the collections or payments processes.

## Working Capital and Liquidity

- explain liquidity and compare issuers' liquidity levels

- A. Incorrect because this is the carrying amount. The full amount has been expensed for financial reporting purposes leaving a carrying amount of 0.
- B. Correct** because using the straight-line method, the company will deduct  $1/5$  for the taxes in Year 1 =  $10 / 5 = 2$ , leaving a balance of  $10 - 2 = 8$ . The tax base of an asset or liability is the amount at which the asset or liability is valued for tax purposes, whereas the carrying amount is the amount at which the asset or liability is recorded in the financial statements.
- C. Incorrect because this is the total amount of the expense. This would be correct only if the company was not able to amortize the expenses over time for tax purposes and they had expected future economic benefits.

## Analysis of Income Taxes

- contrast accounting profit, taxable income, taxes payable, and income tax expense and temporary versus permanent differences between accounting profit and taxable income

- A. Incorrect because the cyclical nature of the industry could also influence the analyst's choice of time frame because the forecast period should be long enough to allow the business to reach an expected mid-cycle level of sales and profitability.
- B. Incorrect because the time frame should ideally correspond with average portfolio turnover of the portfolio.
- C. **Correct** because the time frame should ideally correspond with average portfolio turnover of the portfolio.  
Furthermore, the cyclical nature of the industry could also influence the analyst's choice of time frame because the forecast period should be long enough to allow the business to reach an expected mid-cycle level of sales and profitability.

## Introduction to Financial Statement Modeling

- explain considerations in the choice of an explicit forecast horizon and an analyst's choices in developing projections beyond the short-term forecast horizon

- A. Incorrect because economic responses to an investment often affect its profitability, and these responses have to be correctly anticipated by companies. For example, in response to a successful investment, competitors can enter and reduce the investment's profitability. Companies that make highly profitable investments often find that a competitive marketplace eventually causes profitability to revert to normal levels.
- B. Incorrect because incorporating sunk costs is a common capital allocation pitfall. Capital allocation decisions should ignore sunk costs.
- C. **Correct** because NPV should be used to evaluate projects instead of the impact on short-term accounting numbers. Companies sometimes have incentives to boost EPS, net income, or ROE. Many investments, even those with strong NPVs, do not increase these accounting numbers in the short run and may even reduce them. Paying too much attention to short-run accounting numbers can result in a company choosing investments that are not in the long-run economic interests of its shareholders.

## Capital Investments and Capital Allocation

- describe principles of capital allocation and common capital allocation pitfalls

- A. Incorrect because as far as the law is concerned, a corporation has many of the rights and responsibilities of an individual and can engage in many of the same activities. For example, a corporation can enter into contracts, hire employees, sue and be sued, borrow and lend money, make investments, and pay taxes. Furthermore, the separation of operating control from ownership enables the corporation to finance itself from a larger universe of potential investors who are not required to have expertise in operating the business. Thus, it is not the existence of a corporation's legal entity, but its separation between management and ownership that facilitates greater access to capital.
- B. Incorrect because in many countries, a tax disadvantage is associated with the corporate business structure because shareholders must pay a tax on distributions that have already been taxed at the corporate level. Despite this disadvantage, the corporate business structure remains attractive because corporations have the potential capability to raise large amounts of capital from a disparate group of investors. While shareholders may be taxed on distributions, owners in other business structures are taxed on profits, regardless of distribution.
- C. **Correct** because the separation between ownership and management allows corporations to access capital more easily than other business structures because capital is the only requirement for owners to join the business. While more expensive to form and operate than other business structures, the corporate structure is typically preferred when capital requirements for a business overwhelm what could be raised by an individual or limited number of individuals.

## Organizational Forms, Corporate Issuer Features, and Ownership

- describe key features of corporate issuers

- A. Incorrect because net income will not be impacted, as the increase in the carrying amount does not go through the income statement. If a revaluation initially increases the carrying amount of the asset class, the increase in the carrying amount of the asset class bypasses the income statement and goes directly to equity under the heading of revaluation surplus. Asset revaluations that increase the carrying amount of an asset initially increase depreciation expense, total assets, and shareholders' equity.
- B. **Correct** because if a revaluation initially increases the carrying amount of the asset class, the increase in the carrying amount of the asset class bypasses the income statement and goes directly to equity under the heading of revaluation surplus. Asset revaluations that increase the carrying amount of an asset initially increase depreciation expense, total assets, and shareholders' equity.
- C. Incorrect because the total asset asset turnover is revenue divided by total assets. A revaluation increases total assets but does not change revenue. Since the denominator increases and the numerator stays the same, the total asset turnover will decrease.

## Analysis of Long-Term Assets

- explain and evaluate how impairment and derecognition of property, plant, and equipment and intangible assets affect the financial statements and ratios

- A. Incorrect because an inventory write-down reduces both profit and the carrying amount of inventory on the balance sheet and thus has a negative effect on profitability, liquidity, and solvency ratios. In the event that the value of inventory declines below the carrying amount on the balance sheet, the inventory carrying amount must be written down to its net realizable value and the loss (reduction in value) recognized as an expense on the income statement. This expense may be included as part of cost of sales or reported separately. Hence, cost of sales will be higher (not lower).
- B. Incorrect because an inventory write-down positively affects activity ratios (for example, inventory turnover and total asset turnover) because the asset base (denominator) is reduced. Hence, inventory turnover (cost of sales or cost of goods sold / average inventory) will be higher (not lower) as the numerator (cost of sales) is higher and the denominator (average inventory) is lower.
- C. **Correct** because an inventory write-down reduces both profit and the carrying amount of inventory on the balance sheet and thus has a negative effect on profitability, liquidity, and solvency ratios. However, activity ratios (for example, inventory turnover and total asset turnover) will be positively affected by a write-down because the asset base (denominator) is reduced. Accordingly, days of inventory on hand (number of days in period / inventory turnover) will be lower as the denominator (inventory turnover ratio) is higher.

## Analysis of Inventories

- describe the measurement of inventory at the lower of cost and net realisable value and its implications for financial statements and ratios

Solution

A. Incorrect because it uses the geometric mean formula, not the geometric mean return formula:

$$\sqrt[10]{2.2\% \times 6.2\% \times 8.9\% \times 9.3\% \times 10.5\% \times 11.7\% \times 12.3\% \times 14.1\% \times 15.3\% \times 18.4\%} = 9.62\%$$

B. Correct because the geometric mean return is calculated as the  $T$ th root of the product of  $T$  terms, where the terms are one plus the returns and  $T$  is the number of returns. After taking the  $T$ th root, subtract one:

$$R_G = \left[ \prod_{t=1}^T (1 + R_t) \right]^{\frac{1}{T}} - 1$$

where

$R_G$  = the geometric mean return

$T$  = the number of returns

$R_t$  = the return in year  $t$

$$R_G = \sqrt[10]{1.022 \times 1.062 \times 1.089 \times 1.093 \times 1.105 \times 1.117 \times 1.123 \times 1.141 \times 1.153 \times 1.184} - 1 \\ = 10.80\%$$

C. Incorrect because it is the arithmetic mean not the geometric mean return:

$$\frac{2.2\% + 6.2\% + 8.9\% + 9.3\% + 10.5\% + 11.7\% + 12.3\% + 14.1\% + 15.3\% + 18.4\%}{10} = 10.89\%$$

## Rates and Returns

- calculate and interpret different approaches to return measurement over time and describe their appropriate uses

A. **Correct** because the indirect-to-direct cash flow conversion process involves three steps.

Step 1 Calculate total operating expenses as = total revenue – net income = \$359 million – \$35 million = \$324 million.

Step 2 There are no non-cash expenses or revenues, therefore total expenses = \$324 million, and total cash revenues = \$359 million.

Step 3 Total cash operating expenses = total operating expenses plus the decrease in income tax payable minus the increase in interest expense payable = \$324 million + \$16 million – \$22 million = \$318 million.

B. Incorrect because it mistakenly adds the decrease in prepaid income tax payable and subtracts the decrease in other accrued liabilities. Therefore, cash paid for operating expenses is incorrectly converted as follows: \$324 million – \$16 million + \$22 million = \$330 million.

C. Incorrect because the calculation is based on the total revenue amount of \$359 million instead of the total expense amount of \$324 million as follows: \$359 + 16 million – \$22 million = \$353 million.

## Analyzing Statements of Cash Flows I

- demonstrate the conversion of cash flows from the indirect to direct method

## Solution

- A. Incorrect because credit cycles tend to be longer, deeper, and sharper than business cycles.
- B. Incorrect because whereas financial variables tend to co-vary closely with each other and can often help explain the size of an economic expansion or contraction, they are not always synchronized with the traditional business cycle.
- C. **Correct** because credit cycles tend to be longer, deeper, and sharper than business cycles. Although the length of a business cycle varies from peak to trough, the average length of a credit cycle is mostly found to be longer than that of the business cycle.

## Understanding Business Cycles

- describe credit cycles

- A. Incorrect because internally generated development costs are unrelated to revenue recognition.
- B. **Correct** because analysts' concerns may be raised with respect to the capitalization of expenditures for intangible assets such as internally generated development costs.
- C. Incorrect because internally generated development costs are intangible and not likely to be capitalized as long-lived assets.

## Financial Reporting Quality

- describe accounting warning signs and methods for detecting manipulation of information in financial reports

- A. Incorrect because in a fixed parity currency regime excess private demand for the domestic currency implies a rapidly growing stock of foreign exchange reserves. Deficient demand for the currency depletes foreign exchange reserves and exerts deflationary pressure on the economy.
- B. Incorrect because in a fixed parity currency regime excess private demand for the domestic currency implies a rapidly growing stock of foreign exchange reserves.
- C. **Correct** because in a fixed parity currency regime excess private demand for the domestic currency implies a rapidly growing stock of foreign exchange reserves, expansion of the domestic money supply, and potentially accelerating inflation.

## The Foreign Exchange Market and Capital Flows

- describe exchange rate regimes and explain the effects of exchange rates on countries' international trade and capital flows

- A. **Correct** because IRR is the required rate of return for which  $NPV = 0$ . If IRR is greater than the required rate of return, then  $NPV$  of cash flows discounted at the required rate of return will be greater than zero, not less than zero. The opposite also holds. With an IRR less than the required rate of return (zero),  $NPV$  will be less than zero, or negative.
- B. Incorrect because  $NPV$  is negative when the discount rate is higher than the IRR for the given cash flow pattern of the project.
- C. Incorrect because  $NPV$  is negative when the discount rate is higher than the IRR for the given cash flow pattern of the project.

## Capital Investments and Capital Allocation

- describe the capital allocation process, calculate net present value (NPV), internal rate of return (IRR), and return on invested capital (ROIC), and contrast their use in capital allocation

- A. Incorrect because the variance of a random variable is the expected value (the probability-weighted average) of squared deviations from the random variable's expected value.
- B. Incorrect because standard error is the standard deviation of the sampling distribution of the parameter, 'standard deviation' in general and 'standard error' are two distinct concepts, and the terms are not interchangeable. Simply put, standard deviation measures the dispersion of the data from the mean, whereas standard error measures how much inaccuracy of a population parameter estimate comes from sampling.
- C. **Correct** because sampling error is the difference between the observed value of a statistic and the quantity it is intended to estimate as a result of using subsets of the population.

## Estimation and Inference

- compare and contrast simple random, stratified random, cluster, convenience, and judgmental sampling and their implications for sampling error in an investment problem

- A. Incorrect because the D/E ratio measures the amount of debt capital relative to equity capital. A higher ratio indicates weaker solvency.
- B. Incorrect because the debt-to-EBITDA ratio estimates how many years it would take to repay total debt based on earnings before income taxes, depreciation and amortization. An increase in the number years to repay total debt with EBITDA indicates a weaker solvency.
- C. **Correct** because a higher fixed charge coverage ratio implies stronger solvency, offering greater assurance that the company can service its debt (i.e., bank debt, bonds, notes, and leases) from normal earnings. The fixed charge coverage ratio is  $(\text{EBIT} + \text{Lease payments}) / (\text{Interest payments} + \text{Lease payments})$ .

## Financial Analysis Techniques

- calculate and interpret activity, liquidity, solvency, and profitability ratios

A. **Correct** because the annualized return is calculated using the formula for annualized return,  $R_{annual} = (1+R_{period})^c$ , where:

$$R_{period} = 12\%$$

$c = 12/16$ , because one year contains  $12/16^{th}$  of a 16-month period.

Plugging in the numbers:

$$R_{annual} = 1.12^{(12/16)} - 1 = 0.0887 \text{ or } = 8.87\%$$

- B. Incorrect because the return is incorrectly calculated as  $12\% \times 12/16 = 9.00\%$ .  
C. Incorrect because the return is incorrectly calculated as  $(1 + 0.12/16)^{12} - 1 = 1.0075^{12} - 1 = 9.38\%$ .

## Rates and Returns

- calculate and interpret major return measures and describe their appropriate uses

- A. Incorrect because a distribution that has fatter tails than the normal distribution is referred to as leptokurtic or fat-tailed; a distribution that has thinner tails than the normal distribution is referred to as being platykurtic or thin-tailed; and a distribution similar to the normal distribution as concerns relative weight in the tails is called mesokurtic.
- B. Correct** because a distribution that has fatter tails than the normal distribution is referred to as leptokurtic or fat-tailed; a distribution that has thinner tails than the normal distribution is referred to as being platykurtic or thin-tailed; and a distribution similar to the normal distribution as concerns relative weight in the tails is called mesokurtic.
- C. Incorrect because a distribution that has fatter tails than the normal distribution is referred to as leptokurtic or fat-tailed; a distribution that has thinner tails than the normal distribution is referred to as being platykurtic or thin-tailed; and a distribution similar to the normal distribution as concerns relative weight in the tails is called mesokurtic.

## Statistical Measures of Asset Returns

- interpret and evaluate measures of skewness and kurtosis to address an investment problem

A. Incorrect because the 1 September share issuance was doubled, despite the fact that these shares were issued after the split, and because share amounts were not weighted by the fraction of the year they were outstanding.  
 $\text{EPS} = 3,500,000 / (2,400,000 + 600,000) = 1.1667 = 1.17.$

B. **Correct** because for EPS calculation purposes, a stock split is treated as if it occurred at the beginning of the period. Basic EPS is \$1.40, calculated as follows:

Action	Split-adjusted shares outstanding	Fraction of year	Weighted shares
Beginning balance	2,400,000	8/12	1,600,000
300,000 shares issued 1 September	2,700,000	4/12	900,000
Total	---	---	2,500,000

$$\text{Basic EPS} = \$3,500,000 / 2,500,000 = \$1.40.$$

C. Incorrect because the 1 August stock split is weighted to be in effect only for the last 5 months of the year, rather than the correct treatment that assumes it occurred at the beginning of the period:

Action	Shares outstanding	Fraction of year	Weighted shares
Beginning balance	1,200,000	7/12	700,000
Stock split 1 August	2,400,000	1/12	200,000
300,000 shares issued 1 September	2,700,000	4/12	900,000
Total	---	---	1,800,000

$$\text{Diluted EPS} = 3,500,000 / 1,800,000 = 1.94.$$

## Analyzing Income Statements

- describe how earnings per share is calculated and calculate and interpret a company's basic and diluted earnings per share for companies with simple and complex capital structures including those with antidilutive securities

- A. Incorrect because there is a whole range of interconnected ways in which an increase in the central bank's policy rate can reduce real domestic demand and net external demand (that is, the difference between export and import consumption). Therefore, while an increase in the policy rate may lead to decreasing real domestic demand, it will most likely not lead to increasing net external demand.
- B. Incorrect because there is a whole range of interconnected ways in which an increase in a central bank's policy rate can reduce real domestic demand and net external demand (that is, the difference between export and import consumption). Therefore, while an increase in the policy rate may lead to decreasing net external demand, it will most likely not lead to increasing real domestic demand.
- C. **Correct** because there is a whole range of interconnected ways in which an increase in a central bank's policy rate can reduce real domestic demand and net external demand (that is, the difference between export and import consumption).

## Monetary Policy

- describe tools used to implement monetary policy tools and the monetary transmission mechanism, and explain the relationships between monetary policy and economic growth, inflation, interest, and exchange rates

- A. Incorrect because, the probability of a Type I error in testing a hypothesis is known as the level of significance of the test. Hence, by definition, a smaller significance level would result in a lower probability of a Type I error.
- B. **Correct** because, all else equal, if we decrease the probability of a Type I error by specifying a smaller significance level (say 0.01 rather than 0.05), we increase the probability of making a Type II error because we will reject the null less frequently, including when it is false.
- C. Incorrect because the probability of a Type I error in testing a hypothesis is known as the level of significance of the test. Hence, by definition, a smaller significance level would result in a smaller probability of a Type I error. Furthermore, the only way to reduce the probabilities of both types of errors simultaneously is to increase the sample size,  $n$ .

## Hypothesis Testing

- explain hypothesis testing and its components, including statistical significance, Type I and Type II errors, and the power of a test.

- A. Incorrect because a sign test is most appropriate for testing mean differences (paired comparisons test) in nonparametric data.
- B. **Correct** because the Mann–Whitney U-test is most appropriate for tests of differences in means for nonparametric data such as analysts' rankings.
- C. Incorrect because the Wilcoxon signed-rank test is most appropriate for testing the significance of a single mean or mean differences (paired comparisons test) for nonparametric data.

## Hypothesis Testing

- compare and contrast parametric and nonparametric tests, and describe situations where each is the more appropriate type of test

- A. Incorrect because under the conditions of monopolistic competition entry into and exit from the market are possible with fairly low, (not high), costs.
- B. Correct** because under the conditions of monopolistic competition there are a large number of potential buyers and sellers.
- C. Incorrect because under the conditions of monopolistic competition firms have some pricing power. However, because there are relatively low entry and exit costs, competition will, in the long run, drive prices and revenues down toward an equilibrium similar to perfect competition.

## The Firm and Market Structures

- describe characteristics of perfect competition, monopolistic competition, oligopoly, and pure monopoly

- A. Incorrect because financial tools are the actions used to reinforce cooperative or non-cooperative stances via financial mechanisms. Examples of cooperative financial tools include the free exchange of currencies across borders and allowing foreign investment.
- B. **Correct** because economic tools can also be non-cooperative in nature. Nationalization, the process of transferring an activity or industry from private to state control, is a non-cooperative approach to asserting economic control.
- C. Incorrect because national security tools are those used to influence or coerce a state actor through direct or indirect impact on the country's resources, people, or borders. The most extreme example of a national security tool is that of armed conflict.

## Introduction to Geopolitics

- describe tools of geopolitics and their impact on regions and economies

- A. Incorrect because Portfolio 1 has the highest return but also the lowest safety-first ratio among the three portfolios. Therefore, it is not the optimal portfolio according to Roy's safety-first criterion.
- B. Incorrect because, although Portfolio 2 has the lowest standard deviation of returns among the three portfolios, it is not the optimal portfolio according to Roy's safety-first criterion.
- C. **Correct** because using the formula for a safety-first optimal portfolio,  $[E(R_p) - R_L]/\sigma_p$ , where  $E(R_p)$  is the portfolio's expected return,  $R_L$  is the threshold return (here being  $\$25,000/\$500,000 = 5\%$ ) and  $\sigma_p$  is the portfolio's standard deviation of return, the safety-first ratios for the three portfolios are:

Portfolio 1:  $(0.20 - 0.05)/0.17 = 0.88$ .

Portfolio 2:  $(0.14 - 0.05)/0.10 = 0.90$ .

Portfolio 3:  $(0.17 - 0.05)/0.13 = 0.92$ .

If returns are normally distributed, the safety-first optimal portfolio *maximizes* the safety-first ratio (SFRatio). Therefore, Portfolio 3 is the optimal portfolio according to Roy's safety-first criterion.

## Portfolio Mathematics

- define shortfall risk, calculate the safety-first ratio, and identify an optimal portfolio using Roy's safety-first criterion

## Solution

- A. Incorrect because it assumes the 30<sup>th</sup> percentile is 30% of the largest observation;  $0.30 \times (9.0\%) = 2.7\%$ . This is also the location of the 30<sup>th</sup> percentile and the value of the second observation.
- B. Incorrect because it uses the sample size instead of  $n + 1$  in the percentile formula;  $8 \times (30 / 100) = 2.4$ ;  $2.7\% + [(2.4 - 2.0) \times (4.1\% - 2.7\%)] = 3.3\%$ .
- C. **Correct** because the  $y$ th percentile is the value at or below which  $y\%$  of observations lie. The location of a percentile is:  $(n + 1) \times (y / 100)$ ; here, the location of the 30<sup>th</sup> percentile is  $(8 + 1) \times (30 / 100) = 2.7$ . The value of 30<sup>th</sup> percentile is determined using linear interpolation:  $2.7\% + [(2.7 - 2.0) \times (4.1\% - 2.7\%)] = 3.7\%$ .

## Statistical Measures of Asset Returns

- calculate, interpret, and evaluate measures of central tendency and location to address an investment problem

- A. Incorrect because, under the assumption that wages and prices are rigid, if both fiscal and monetary policy are easy, then the joint impact will be highly expansionary leading to an increase in aggregate demand, lower interest rates (at least if the monetary impact is larger), and growing private and public sectors.
- B. Incorrect because, under the assumption that wages and prices are rigid, if taxes are cut or government spending rises, the expansionary fiscal policy will lead to an increase in aggregate output. If this is accompanied by a reduction in money supply to offset the fiscal expansion, then interest rates will increase and have a negative effect on private sector demand. We have higher output and higher interest rates, and government spending will be a larger proportion of overall national income.
- C. **Correct** because, under the assumption that wages and prices are rigid, if a fiscal contraction is accompanied by expansionary monetary policy and low interest rates, then the private sector will be stimulated and will increase as a share of GDP, while the public sector will shrink.

## Monetary Policy

- explain the interaction of monetary and fiscal policy

## Solution

A. Incorrect because it uses  $n$  instead of  $n - 1$  in the denominator for the calculation of the target downside deviation.

Thus the formula becomes  $s_{\text{Target}} = [(\sum_{i=1}^n \text{for all } X_i \leq B (X_i - B)^2 / n]^{0.5} = \{(2 - 5)^2 + (-4 - 5)^2\} / 4]^{0.5} = (90/4)^{0.5} = 4.743$  or 4.7%.

B. Incorrect because it calculates the standard deviation of the quarterly returns, not the target downside deviation.

The mean is  $(2\% + 6\% + -4\% + 8\%) / 4 = 3\%$ . The standard deviation is  $s = [\sum_{i=1}^n (X_i - \bar{X})^2 / (n - 1)]^{0.5} = \{(2 - 3)^2 + (6 - 3)^2 + (-4 - 3)^2 + (8 - 3)^2\} / 3]^{0.5} = (84/3)^{0.5} = 5.292$  or 5.3%.

C. **Correct** because the target downside deviation, also referred to as the target semideviation, is a measure of dispersion of the observations (here, returns) below the target. It is calculated by  $s_{\text{Target}} = [(\sum_{i=1}^n \text{for all } X_i \leq B (X_i - B)^2 / (n - 1)]^{0.5} = \{(2 - 5)^2 + (-4 - 5)^2\} / (4 - 1)]^{0.5} = (90/3)^{0.5} = 5.477$  or 5.5%.

## Statistical Measures of Asset Returns

- calculate, interpret, and evaluate measures of dispersion to address an investment problem