

Level I of the CFA® Exam

Mock Questions with Answers - Mock Exam 2025 #3 - Second Session (Corporate Finance, Equity, Fixed Income, Derivatives, Alternative Investments & Portfolio Management)

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Q.1 The Weighted Average Cost of Capital (WACC) for a company with the following information is *closest to*?

Market value of debt	\$4 million
Market value of equity	\$12 million
Tax rate	15%
Cost of debt after taxes	20%
Cost of equity	11%

- A. 12.50%
- B. 13.25%
- C. 15.50%

The Weighted Average Cost of Capital (WACC) is a calculation of a firm's cost of capital in which each category of capital is proportionately weighted. It is the average rate that a company is expected to pay to finance its assets. WACC is the minimum average rate of return which a company must earn to satisfy its investors, creditors, and others. The WACC is calculated taking into account the relative weights of each component of the capital structure. The more complex a company's capital structure, the more laborious it is to calculate the WACC.

Here, we are given the market value of debt as \$4 million and the market value of equity as \$12 million. The tax rate is 15%, the cost of debt after taxes is 20%, and the cost of equity is 11%. We can calculate the proportion of the company's debt (w_d) and the proportion of the company's equity (w_e) using these values.

w_d the proportion of the company's debt:

$$= \frac{(\$4 \text{ million})}{(\$12 \text{ million} + \$4\text{million})} = \frac{4}{16}$$

w_e the proportion of the company's equity:

$$= \frac{(\$12 \text{ million})}{(\$12 \text{ million} + \$4\text{million})} = \frac{12}{16}$$

Using these proportions, we can calculate the WACC as follows:

$$\begin{aligned} \text{WACC} &= \frac{12}{16} \times 0.11 + \frac{4}{16} \times 0.20 \\ &= 0.1325 \end{aligned}$$

CFA Level 1, Topic 4 - Corporate Issuers, Learning Module 6 - Capital Structure, LOS 6a: calculate and interpret the weighted-average cost of capital for a company

Q.2 Aero and Beta are commercial aircraft manufacturers. Kayla Mason is an industry analyst evaluating the financial and operating leverage structures of the two competitors. She has collected sales and cost data concerning the manufacturers in an exhibit. She expects unit sales to increase by 5% from their 2012 level.

	Aero	Beta
Sales price per unit (\$)	50	40
Variable costs per unit (\$)	35	30
Total fixed costs (\$)	350,000	250,000
Units produced and sold (2012)	50,000	50,000

Based on the expectations for 2013, Mason will *most likely* conclude that the change in operating income will *most likely* be:

- A. Greater for Aero.
- B. Greater for Beta.
- C. The same for both companies.

The correct answer is option B, which suggests that the change in operating income will be greater for Beta. This conclusion is derived from the calculation of the Degree of Operating Leverage (DOL) for both Aero and Beta. The DOL is a measure of how a percentage change in sales volume will affect operating income. It is calculated using the formula:

$$DOL = \frac{[Q(P - V)]}{[Q(P - V) - F]}$$

Where Q is the quantity of units produced and sold, P is the sales price per unit, V is the variable cost per unit, and F is the total fixed costs.

For Aero, the DOL is calculated as follows:

$$DOL(\text{Aero}) = \frac{50,000(50 - 35)}{[50,000(50 - 35) - 350,000]} = 1.875$$

This means that a 1% increase in Aero's sales volume will result in a 1.875% increase in its operating income.

For Beta, the DOL is calculated as follows:

$$DOL(\text{Beta}) = \frac{50,000(40 - 30)}{[50,000(40 - 30) - 250,000]} = 2.00$$

This means that a 1% increase in Beta's sales volume will result in a 2% increase in its operating

income.

Given that the sales volume is expected to increase by 5%, Aero's operating income will increase by 9.375% ($1.875 \times 5\%$) and Beta's operating income will increase by 10% ($2 \times 5\%$).

CFA Level 1, Topic 4 - Equity Investments, Learning Module 5 - Company Analysis: Past and Present, LOS 5d: evaluate a company's operating profitability and working capital using key measures.

Q.3 Bright Pharmaceuticals has estimated that its new plant will have an NPV of -\$800,000 based on expected cash flows. Bright is considering an additional investment of \$300,000 that would give the company the option of abandoning the project if the financial results are disappointing. This option has an estimated value of \$1,400,000. The value of the new plant, including the option, would *most likely* be calculated as:

- A. \$300,000
- B. \$600,000
- C. \$1,400,000

The NPV of the project is estimated to be -\$800,000. This negative value indicates that the project is expected to result in a loss if carried out as initially planned. However, Bright Pharmaceuticals is considering an additional investment of \$300,000. This investment would provide the company with the option to abandon the project if the financial results are not satisfactory. The estimated value of this option is \$1,400,000.

The value of the new plant, including the option, is calculated by subtracting the cost of the option from the NPV of the project and then adding the value of the option. This can be represented mathematically as follows: $\text{NPV (DCF based)} - \text{Cost of Option} + \text{Value of Options} = -\$800,000 - \$300,000 + \$1,400,000 = \$300,000$.

CFA Level 1, Topic 4 - Corporate Issuers, Learning Module 5 - Capital Investments and Capital Allocation, LOS 5b: describe the capital allocation process, calculate the net present value (NPV), internal rate of return (IRR), and return on invested capital (ROIC), and contrast their use in capital allocation.

Q.4 Which of the following is *most likely* a duty of the nomination committee?

- A. Recruiting qualified board members.
- B. Recording the expenses of board members.
- C. Setting the remuneration of board members.

The nomination committee has a set of specific responsibilities that are crucial to the functioning of a board of directors. These responsibilities primarily revolve around the identification, recommendation, and establishment of procedures and policies for potential board directors. The committee ensures that the directors are qualified and independent, which is essential for the effective functioning of the board.

The nomination committee's primary role is to identify and recommend candidates who are qualified to serve as directors. They establish nomination procedures and policies, including criteria for board directors, the search for board directors, and the identification of qualified potential board directors. They also ensure director independence. All these duties are geared towards recruiting qualified board members, making option A the correct answer.

B is incorrect. The nomination committee's duties are focused on the recruitment and recommendation of potential board directors, not on financial or administrative tasks such as recording expenses. This task is typically handled by the finance or administrative department of the organization, not the nomination committee.

C is incorrect. The responsibility of setting the remuneration of board members typically falls under the purview of the compensation committee, not the nomination committee. The nomination committee's role is to identify and recommend potential board directors, not to determine their remuneration.

CFA Level 1, Topic 4 - Corporate Issuers, Learning Model 3 - Corporate Governance: Conflicts, Mechanisms, Risks, and Benefits, LOS 3b: describe corporate governance and mechanisms to manage stakeholder relationships and mitigate associated risks

Q.5 Which of the following *best* describes fractionalization as used in business models?

- A. Transferring ownership of an asset to customers with lower capital and maintenance costs.
- B. An alternative to purchasing a product or service, where a customer can rent items for a duration of their choice.
- C. An alternative form of purchasing an asset where value is created by selling an asset in small quantities or using an asset at different times.

Fractionalization in business models refers to a unique approach where value is created by selling an asset in smaller quantities or using an asset at different times. This method allows for a more flexible and affordable way for consumers to access and utilize assets. It is a popular strategy in various industries, including real estate, aviation, and even art, where high-value assets are often out of reach for the average consumer. By breaking down the ownership or usage of these assets into smaller, more manageable parts, businesses can attract a wider customer base and generate more revenue. This is why option C is the correct answer.

A is incorrect. This choice refers to the concept of transferring ownership of an asset to customers with lower capital and maintenance costs. While this might seem similar to fractionalization, it is fundamentally different. This option describes a leasing model, where the ownership of the asset is temporarily transferred to the customer for a fee. In a leasing model, the customer does not own any part of the asset, they merely rent it for a period of time. This is different from fractionalization, where customers actually own a portion of the asset.

B is incorrect. This choice describes an alternative to purchasing a product or service, where a customer can rent items for a duration of their choice. This is a description of a rental or subscription model, not fractionalization. In a rental or subscription model, customers pay a fee to use a product or service for a specific period of time. They do not own any part of the product or service, and once their subscription or rental period ends, they no longer have access to it. This is different from fractionalization, where customers own a portion of the asset and can use it at different times.

CFA Level 1, Topic 4 - Corporate Issuers, Learning Module 7 - Business Models, LOS 7b: describe various types of business models.

Q.6 An analyst is considering buying a one-year call option on a non-dividend-paying stock with an exercise price of \$100. The current stock price is \$95. The stock price is expected to go up or down by 18% in one year. Assume a risk-free rate of return is 4%. The number of units that the analyst needs to buy to create a risk-free portfolio is *closest to*:

- A. 0.35
- B. 0.45
- C. 2.90

The question requires us to calculate the hedge ratio, which is a measure of the number of units of a security needed to create a risk-free portfolio. In this case, the security is a one-year call option on a non-dividend-paying stock with an exercise price of \$100. The current stock price is \$95, and the stock price is expected to go up or down by 18% in one year. The risk-free rate of return is assumed to be 4%.

The hedge ratio is calculated using the formula:

$$h = \frac{c_1^u - c_1^d}{S_1^u - S_1^d}$$

Where:

c_1^u and c_1^d are the values of the call option if the stock price goes up and down respectively, and S_1^u and S_1^d are the stock prices if the stock price goes up and down respectively.

Using the given information, we can calculate the values as follows:

$$S_1^u = S_0 R^u = \$95 \times 1.18 = \$112.10$$

$$c_1^u = \max(0, S_1^u - X) = \$112.10 - \$100 = \$12.10$$

$$S_1^d = S_0 R^d = \$95 \times 0.82 = \$77.90$$

$$c_1^d = \max(0, S_1^d - X) = \$0$$

Substituting these values into the hedge ratio formula, we get:

$$h = \frac{12.10 - 0}{112.10 - 77.90} = 0.353$$

CFA Level 1, Topic 4 - Derivatives, Learning Module 10- Forward Commitment and Contingent Claim Features and Instruments, LOS 10a: explain how to value a derivative using a one-period binomial model

Q.7 Which of the following statements regarding business models is *least likely* correct?

- A. A direct sales strategy may involve an intermediary.
- B. A price taker in a market faces less pricing risk from competitors than a price setter.
- C. A business model helps analysts understand the total available market and inherent risks.

In economic theory, a price taker is a firm that does not have the market power to influence the price of a product. It is subject to the prevailing market price and cannot dictate or change it. On the other hand, a price setter, also known as a price maker, has the ability to influence the price of a product due to its significant market share or unique product offering. Therefore, a price setter faces less pricing risk from competitors as it has the power to set its own prices, unlike a price taker which must accept the market price. This gives the price setter a competitive advantage and reduces its exposure to pricing risk.

A is incorrect. Direct sales refer to selling products directly to the consumer without a middleman. However, in some cases, an intermediary may be involved in a direct sales intermediary. This intermediary acts as an agent between the producer and the consumer, facilitating the sale of the product. The intermediary does not take ownership of the product, but instead earns a commission for their role in the sales process. Therefore, the presence of an intermediary does not negate the fact that the strategy is a direct sales strategy.

C is incorrect. A business model outlines a company's plan for making a profit. It identifies the products or services the business plans to sell, its target market, and any anticipated expenses. A well-defined business model can help analysts determine the total market share available for a business and identify important competitors and risks. It provides a clear picture of the company's revenue generation strategies, operational structure, and competitive advantage, which are crucial for understanding the total available market and inherent risks.

CFA Level 1, Topic 4 - Corporate Issuers, Learning Module 7- Business Models, LOS 4a: Describe key features of business models.

Q.8 Which of the following business structures *most likely* has a legal identity?

- A. Limited companies.
- B. Limited partnerships.
- C. General partnerships.

A limited company, also known as a corporation, is formed when the founders file articles of incorporation with a regulatory authority. This process gives the company a separate legal identity. In legal terms, a corporation is treated as an individual with its own rights and responsibilities. This means that it can enter into contracts, own property, sue and be sued in its own name. This legal identity separates the company's assets and liabilities from those of its owners, providing them with limited liability. This is a key feature of corporations and is not typically found in other business structures. This is why option A, limited companies, is the correct answer.

B is incorrect. Limited partnerships do not have a separate legal identity. In a limited partnership, there are two types of partners: general partners and limited partners. General partners manage the business and are personally liable for the partnership's debts. Limited partners, on the other hand, are investors who do not participate in the management of the business and whose liability is limited to their investment. The partnership itself does not have a separate legal identity. Instead, the rights and responsibilities of the partners are outlined in the partnership agreement.

C is incorrect. General partnerships also do not have a separate legal identity. In a general partnership, all partners share in the management of the business and each partner is personally liable for the partnership's debts. Like limited partnerships, the rights and responsibilities of the partners in a general partnership are outlined in the partnership agreement. The partnership itself does not have a separate legal identity. This means that it cannot enter into contracts, own property, sue or be sued in its own name. Instead, these actions are taken by the partners on behalf of the partnership.

Level 1, Topic 4 - Corporate Issuers, Learning Module 1- Corporate Structures and Ownerships, LOS 1a: compare the organizational forms of businesses

Q.9 Rector Incorporated is a manufacturing firm with a capital structure comprising equity and debt. The current market value of equity is \$2.0 million, and the beta of the stock is 1.2. The company has outstanding bonds amounting to \$4 million in face value, which pay semi-annual coupons at an annual rate of 8%. The yield-to-maturity is 9%, and the remaining term to maturity is 5 years. The corporation pays tax at a rate of 25%, and the equity risk premium and risk-free rate are 4% and 2%, respectively. Rector Incorporated's weighted average cost of capital (WACC) is *closest to*

- A. 4.55%
- B. 6.77%

C. 7.59%

The present value of the company's debt is calculated using the formula for the present value of an annuity, considering the semi-annual coupon payments, yield-to-maturity, and the term to maturity. This results in a present value of \\$3,841,746.

To calculate the weight of debt in the capital structure, the ratio of the present value of debt to the total market value of the firm's equity and debt is used. In this case, the weight of debt is:

$$w_d = \frac{\text{Present Value of Debt}}{\text{Market Value of Debt} + \text{Market Value of Equity}} = 65.76\%$$

Similarly, the weight of equity is calculated as the ratio of the market value of equity to the total market value of the firm's equity and debt:

$$w_e = \frac{\text{Market Value of Equity}}{\text{Market Value of Debt} + \text{Market Value of Equity}} = 34.24\%$$

Calculating WACC:

The WACC formula is:

$$\text{WACC} = w_d r_d (1 - t) + w_p r_p + w_e r_e$$

Where:

- w_d, w_p, w_e are the weights of debt, preferred stock, and equity in the capital structure,
- r_d, r_p, r_e are the respective costs of debt, preferred stock, and equity,
- t is the company's marginal tax rate.

In this case, we are only considering debt and equity, so the WACC formula simplifies to:

$$\text{WACC} = w_d r_d (1 - t) + w_e r_e$$

Substituting the values provided:

- $w_d = 65.76\%$
- $r_d = 9\%$
- $t = 25\%$

- $w_e = 34.24\%$
- $r_e = 6.8\%$ (calculated as $2\% + 1.2 \times 4\%$)

WACC is then calculated as:

$$WACC = 0.6576 \times 9\% \times (1 - 0.25) + 0.3424 \times 6.8\%$$

$$WACC = 0.6576 \times 6.75\% + 0.3424 \times 6.8\%$$

$$WACC = 4.44\% + 2.33\% = 6.77\%$$

CFA Level 1, Topic 4 - Corporate Issuers, Learning Module 6-Capital Structure, LOS 6a: calculate and interpret a company's weighted average cost of capital (WACC) of a company.

Q.10 A security market index represents the:

- A. risk of a security market.
- B. value of the security market as a whole.
- C. value of a given security market, market segment, or asset class.

A security market index is a statistical measure that reflects the performance of a group of securities. The securities included in the index are representative of a specific market, market segment, or asset class. The index is calculated by averaging the price of each security in the index, weighted by its market capitalization. The value of the index fluctuates with the prices of the underlying securities, providing a snapshot of the overall performance of the market, segment, or asset class it represents. This is why option C, which states that a security market index represents the value of a given security market, market segment, or asset class, is the correct answer.

A is incorrect. While it is true that a security market index can provide some insight into the level of risk in a market, segment, or asset class, it is not primarily a measure of risk. The index value is a reflection of the performance of the securities it includes, not the risk associated with them. Risk in the context of investing typically refers to the potential for loss, which can be influenced by a variety of factors not captured by the index value. Therefore, stating that a security market index represents the risk of a security market is not accurate.

B is incorrect. A security market index does not represent the value of the security market as a whole. Instead, it represents a specific subset of the market. The securities included in the index are chosen to be representative of a particular market, segment, or asset class, not the entire market. For example, the S&P 500 index represents the performance of 500 large companies listed on stock exchanges in the United States, not the entire U.S. stock market. Therefore, stating that a security market index represents the value of the security market as a whole is not accurate.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 1- Security Market Indexes, LOS 1a: describe a security market index.

Q.11 The Gordon growth model **cannot** be used to estimate intrinsic value if the associated company:

- A. is rapidly growing.
- B. assumes a perpetual dividend growth rate.
- C. retains a portion of its profits for reinvestment purposes.

The Gordon growth model is a dividend discount model that assumes a company's dividends grow at a constant rate in perpetuity. It is used to calculate the intrinsic value of a stock, excluding any potential market influences. The model is most suitable for stable, mature companies that pay regular dividends. However, it is not suitable for companies that are experiencing rapid growth. This is because the model assumes a constant growth rate, which is unlikely in rapidly growing companies where growth rates can fluctuate significantly. Rapid growth often leads to inconsistent dividend payments, which contradicts the assumptions of the Gordon growth model.

B is incorrect. The Gordon growth model assumes a perpetual dividend growth rate. This means that the model assumes that the company's dividends will grow at a constant rate forever. This assumption is suitable for stable, mature companies that pay regular dividends. However, if a company is rapidly growing, its dividend growth rate is likely to fluctuate, making the Gordon growth model unsuitable.

C is incorrect. The Gordon growth model can be applied even if the company retains a portion of its profits for reinvestment purposes. This is because the model assumes that the company's dividends grow at a constant rate, regardless of whether a portion of the profits is retained for reinvestment. As long as the retained earnings do not result in fluctuating dividend payments, the Gordon growth model can be used.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 3- Market Efficiency, LOS 3b: contrast between market value and intrinsic value.

Q.12 The length of a company's operating cycle has increased in the current year. Which of the following statements *most* accurately justifies the reason for this increase?

- A. The company's inventory balance has decreased.
- B. The company is taking advantage of early payment discounts.
- C. The average number of days to collect payments from customers has increased.

The operating cycle of a company is calculated as the sum of the number of days of receivables and the number of days in inventory. This cycle represents the time it takes for a company to turn its inventory into sales and then collect the payments from these sales. Therefore, any factor that increases the time it takes to sell inventory or collect payments will increase the operating cycle.

Option C states that the average number of days to collect payments from customers has increased. This directly impacts the number of days of receivables, which is a component of the operating cycle. If it takes longer for a company to collect payments from its customers, the number of days of receivables will increase, thereby increasing the operating cycle. This could be due to a variety of reasons such as changes in credit terms, slower paying customers, or inefficiencies in the company's collection process.

A is incorrect. Option A suggests that the company's inventory balance has decreased. The number of days in inventory is calculated as inventory divided by the average day's cost of goods sold. If the inventory balance decreases, it means that the company is selling its inventory faster, which would decrease the number of days in inventory. This would, in turn, decrease the operating cycle, not increase it. Therefore, a decrease in the company's inventory balance would not justify an increase in the operating cycle.

B is incorrect. Option B suggests that the company is taking advantage of early payment discounts. Early payment discounts can reduce the cost of goods sold and improve a company's cash flow, but they do not directly impact the operating cycle. The operating cycle is concerned with the time it takes to sell inventory and collect payments, not the cost of goods sold. Therefore, taking advantage of early payment discounts would not justify an increase in the operating cycle.

CFA Level I, Topic 5 - Corporate Issuers, Learning Module 4- Working Capital and Liquidity, LOS 4a: explain the cash conversion cycle and compare issuers' cash conversion cycles.

Q.13 For one of her equity investments, investor Carol March, has specified a Good-till-cancelled orders (GTC), stop 120, limit 95 sell order. The original purchase price of her investment was \$150. If the price of the stock declines below \$120, March's GTC order will *most likely*:

- A. Not be executed.
- B. Be executed, and her maximum loss will be \$25.
- C. Be executed, and her maximum loss will be \$55.

A Good-till-cancelled orders (GTC), stop 120, limit 95 sell order is designed to limit potential losses on an equity investment. In this case, investor Carol March has set a stop order at \$120 and a limit order at \$95. This means that if the price of the stock falls below \$120, the sell order will be triggered, and the stock will be sold. However, the limit order at \$95 ensures that the stock will not be sold for less than this price. Therefore, the maximum potential loss that March could incur from this investment is \$55, which is the difference between the original purchase price of \$150 and the limit price of \$95. This strategy is used by investors to manage their risk and protect their investments from significant losses.

A is incorrect. The statement that the order will not be executed is incorrect. The purpose of a stop-limit order is to limit potential losses on an investment. In this case, the stop order is set at \$120, which means that if the price of the stock falls below this level, the sell order will be triggered. The limit order at \$95 ensures that the stock will not be sold for less than this price. Therefore, the order will be executed once the price of the stock falls below \$120, not the other way around.

B is incorrect. This option incorrectly assumes that the maximum loss will be \$25, which is the difference between the stop price of \$120 and the limit price of \$95. However, this is not the case. The maximum potential loss is actually \$55, which is the difference between the original purchase price of \$150 and the limit price of \$95. The stop-limit order is designed to limit potential losses, not to guarantee a specific loss amount.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 2- Security Market Indexes, LOS 2g: describe uses of security market indexes.

Q.14 Pedro Lee serves a broker-dealer firm and has negotiated with Grace Arnold, the CEO of Chemco Solutions, to sell her a significant holding of the company's stock. Lee apprehends that the order may be challenging to execute due to the size of the trade. The execution mechanism that Lee should utilize is *most likely*:

- A. Brokered markets.
- B. Crossing networks.
- C. Over-the-counter markets.

In this scenario, Pedro Lee is dealing with a large trade that may be difficult to execute due to its size. The most suitable execution mechanism for this situation is brokered markets, which is option A. The reason behind this is that brokered markets are designed to handle large trades that may not be easily marketable. In a brokered market, brokers play a crucial role in arranging trades among their clients. They have the expertise and the network to find buyers for large quantities of stock that may be difficult to sell in other types of markets. This makes brokered markets the most appropriate choice for Lee's situation.

B is incorrect. Crossing networks, which are a type of order-driven market, are not suitable for this situation. Crossing networks match buy and sell orders from different participants in the market. However, they rely on a large number of traders submitting orders to them. In the case of a large trade like the one Lee is dealing with, there may not be enough traders submitting orders to match the size of the trade. This could result in the trade not being executed or only partially executed, which would not meet Lee's needs.

C is incorrect. Over-the-counter markets, also known as dealer markets, are also not suitable for this situation. In over-the-counter markets, dealers buy and sell securities for their own account. However, they may be unwilling or unable to hold such a large quantity of shares in their inventory. Furthermore, they may not make markets in the specific shares that Lee is trying to sell. This could result in the trade not being executed or only partially executed, which would not meet Lee's needs.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 1- Market organization and structure, LOS 1j: describe how securities, contracts, and currencies are traded in quote-driven, order-driven, and brokered markets.

Q.15 Gene Saunders has purchased a stock using \$15 of her funds and \$30 of borrowed funds. One month after making the investment, the stock falls by 15% in value. Her financing mix meets minimum margin requirements. The initial margin and unannualized return on investment, before considering the payment of fees and commissions, is *closest* to:

- A. 33.3% and -22.5% respectively.
- B. 33.3% and -45.0% respectively.
- C. 50.0% and -15.0% respectively.

The use of leverage magnifies the gain or loss on an investment. In this case, Gene Saunders has used \$15 of her own funds and \$30 of borrowed funds to purchase a stock. This means that the percentage equity or initial margin is calculated as \$15 divided by the total investment (\$30 + \$15), which equals 0.3333 or 33.3%. This is the proportion of the total investment that is financed by her own funds.

Next, we calculate the leverage, which is the ratio of the total position to the equity. In this case, the total position is 100% and the equity is 33.33%, so the leverage is 3.0. This means that for every dollar of her own money, Gene Saunders has borrowed three dollars.

Finally, we calculate the return on investment. The stock has fallen by 15% in value, so the return on investment is the leverage times the change in value, which is 3.0 times -15%, or -45%. This means that Gene Saunders has lost 45% of her investment.

A is incorrect. While the 33.3% correctly represents the percentage equity, the -22.5% does not correctly represent the return on investment. The return on investment is calculated as the leverage times the change in value, which in this case is 3.0 times -15%, or -45%, not -22.5%. Therefore, option A underestimates the loss on the investment.

C is incorrect. Neither the equity nor the debt proportion accounts for 50% of the funds used to purchase the stock. The ratio of equity to debt is 33% to 67%, respectively, not 50% to 50%. Furthermore, the return on investment is not -15%, but -45%, as calculated above. Therefore, option C both misrepresents the financing mix and underestimates the loss on the investment.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 1- Market Organization and Structure, LOS 1f: calculate and interpret the leverage ratio, the rate of return on a margin transaction, and the security price at which the investor would receive a margin call.

Q.16 A market's limit order book quotes the best bid and offer at 35 and 38, respectively. A limit buy order with a price of 36 is placed by a trader. The order will *most likely*:

- A. Make market.
- B. Make a new market.
- C. Fall behind the market.

In the given scenario, the trader places a limit buy order with a price of 36. This price falls between the best bid (35) and the best offer (38). In financial markets, a limit order is an order to buy or sell a security at a specific price or better. A buy limit order can only be executed at the limit price or lower, and a sell limit order can only be executed at the limit price or higher. Therefore, when the trader places a limit buy order at a price that is higher than the best bid but lower than the best offer, it creates a new price point in the market that other traders can now trade against. This is known as making a new market, hence option B is the correct answer.

A is incorrect. The term 'make market' refers to a situation where a buy order is placed with a limit price equal to the best bid. In this case, the trader is not creating a new price point in the market, but rather matching the existing best bid. This would help to maintain the current market price, rather than creating a new one. However, in the given scenario, the trader's limit buy order is placed at a price of 36, which is higher than the best bid of 35. Therefore, the trader is not making the market, but rather creating a new market.

C is incorrect. The term 'fall behind the market' refers to a situation where a buy order is placed with a limit price that is lower than the best bid. In this case, the trader's order would be unlikely to be executed unless the market price falls to match the limit price. This is because other traders would be more likely to trade against higher bids. However, in the given scenario, the trader's limit buy order is placed at a price of 36, which is higher than the best bid of 35. Therefore, the trader's order is not falling behind the market, but rather creating a new market.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 1- Market organization and structure, LOS 1h: compare market orders with limit orders.

Q.17 Which of the following features *most likely* distinguishes common and preference shares?

- A. Voting rights.
- B. Perpetual maturity dates.
- C. Presence of embedded options.

The distinguishing feature between common and preference shares is primarily the voting rights, which is why option A is the correct answer. Common shareholders typically have the right to vote at shareholders' meetings and have a say in the company's policies, board of directors, and other important decisions. This is a significant advantage that common shareholders have over preference shareholders. Preference shareholders, on the other hand, usually do not have voting rights. This means they have no direct influence over the company's policies or decisions. However, they have a higher claim on the company's assets and earnings. This includes earnings dividends, which are paid out before common shareholders. Therefore, the lack of voting rights is a trade-off for a higher claim on assets and earnings.

B is incorrect. The statement that preference shares have perpetual maturity dates is not a distinguishing feature between common and preference shares. Both types of shares can have perpetual maturity dates. This means that the shares do not have a specific date on which the principal is to be repaid. Instead, the shares exist indefinitely, or until the company goes out of business. Therefore, the presence of perpetual maturity dates is a characteristic that is common to both common and preference shares, and does not distinguish one from the other.

C is incorrect. The presence of embedded options is also not a distinguishing feature between common and preference shares. Both types of shares can contain embedded options, such as call or put options. A call option gives the shareholder the right, but not the obligation, to buy more shares at a specified price within a certain time period. A put option, on the other hand, gives the shareholder the right to sell their shares at a specified price within a certain time period. Therefore, the presence of embedded options is a characteristic that is common to both common and preference shares, and does not distinguish one from the other.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 6- Industry and Company Analysis, LOS 6b: describe industry classification methods and compare methods by which companies can be grouped.

Q.18 Which of the following index weighting methods requires an adjustment to the divisor after a stock split?

- A. Price weighting.
- B. Fundamental weighting.
- C. Market capitalization weighting.

A price-weighted index is a type of stock market index where each constituent security is weighted according to its share price. In this method, the divisor remains constant unless there are structural changes in the index components. One such structural change is a stock split. A stock split is a corporate action that increases the number of shares in a company, while simultaneously reducing the price per share. This action does not change the overall market capitalization of the company, but it does change the price of individual shares. Therefore, in a price-weighted index, a stock split necessitates an adjustment to the divisor. This adjustment ensures that the index value remains the same immediately after the split as it was before the split. This is because the index value is calculated by summing the prices of all the constituent securities and dividing by the divisor. If the divisor was not adjusted after a stock split, the index value would decrease, which would not accurately reflect the overall market.

B is incorrect. Fundamental weighting is a method of weighting the constituent securities in an index based on measures of a company's size that are independent of its security price. These measures can include factors such as sales, earnings, book value, or dividends. In this method, a stock split would not necessitate an adjustment to the divisor because the weight of each security is not directly tied to its price. Therefore, a change in the price of a security due to a stock split would not affect the overall index value.

C is incorrect. In a market-capitalization weighted index, the weight of each constituent security is determined by its market capitalization, which is calculated by multiplying the number of shares outstanding by the market price per share. The weight of each security is then the ratio of its market capitalization to the total market capitalization of all the securities in the index. In this method, a stock split would not necessitate an adjustment to the divisor because a stock split does not change a company's overall market capitalization. Therefore, the weight of a security in the index would remain the same before and after a stock split, and the overall index value would not be affected.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 2- Security market indexes, LOS 2e: calculate and analyze the value and return of an index given its weighting method.

Q.19 Which of the following industries is *least likely* cyclical in nature?

- A. Autos.
- B. Utility.
- C. Technology.

Non-cyclical companies are those that produce goods and services that have a relatively stable demand, regardless of the state of the economy. This is because these goods and services are considered necessities, and thus, their demand remains constant. The utility industry falls under this category. Utilities, such as electricity, gas, and water, are essential services that people need on a daily basis. Therefore, regardless of whether the economy is in a boom or a recession, the demand for these services remains relatively stable. This makes the utility industry less cyclical in nature compared to other industries.

A is incorrect. The auto industry is a perfect example of a cyclical industry. This is because the demand for automobiles is strongly correlated with the strength of the overall economy. When the economy is doing well, people have more disposable income to spend on big-ticket items like cars. Conversely, during a recession, people tend to cut back on their spending, especially on expensive items that are not considered necessities. Therefore, the profitability of the auto industry fluctuates with the ups and downs of the business cycle, making it a cyclical industry.

C is incorrect. The technology industry is also considered a cyclical industry. This is because the demand for technology products and services is often influenced by the state of the economy. During economic booms, businesses and individuals are more likely to invest in new technology. However, during economic downturns, they are likely to cut back on such investments. Furthermore, technology products and services can be relatively expensive, and their purchase can often be delayed if necessary. Therefore, like the auto industry, the technology industry's profitability is strongly correlated with the strength of the overall economy, making it a cyclical industry.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 8- Equity Valuation: Concepts and Basic Tools, LOS 8b: describe major categories of equity valuation models.

Q.20 Which of the following is *most likely* the use of Herfindahl-Hirschman Index (HHI) used in industry analysis?

- A. Measuring the profitability of the industry.
- B. Calculating the historical growth rate of the industry.
- C. Measuring the degree of industry concentration.

The Herfindahl-Hirschman Index (HHI) is a tool used to measure the degree of industry concentration, which is why option C is the correct answer. The HHI is a widely accepted measure of market concentration. It is computed by squaring the market share of each firm competing in the market and then summing the resulting numbers. The HHI can range from close to zero to 10,000. The closer the HHI is to 10,000, the more concentrated the market is. An HHI of less than 1,500 is considered to represent a competitive marketplace, an HHI of 1,500 to 2,500 is considered to represent a moderately concentrated marketplace, and an HHI of 2,500 or greater is considered to represent a highly concentrated marketplace. This index is crucial in industry analysis as it provides insights into the competitive landscape of the industry.

A is incorrect. The HHI is not used to measure the profitability of the industry. While it is true that the level of industry concentration can influence profitability, the HHI itself does not provide direct information on profitability. Profitability is typically measured using financial ratios such as return on assets (ROA), return on equity (ROE), or net profit margin. These ratios provide a more direct and accurate measure of a firm's ability to generate profits from its operations. Therefore, using the HHI to measure profitability would be inappropriate and misleading.

B is incorrect. The HHI is not used to calculate the historical growth rate of the industry. The historical growth rate of an industry is typically calculated by examining changes in total industry sales or output over time. This involves a dynamic analysis of the industry over a certain period, which is not provided by the HHI. The HHI is a static measure that does not take into account changes over time. It provides a snapshot of the market concentration at a specific point in time, but it does not provide information on how the industry has grown or evolved over time.

CFA Level 1, Topic 5 - Equity Investments, Learning module 6 - Industry and Competitive Analysis, LOS 6c: determine an industry's size, growth characteristics, profitability, and market share trends

Q.21 Jones Davenport submits a sell order for 12 contracts with a limit price of \$25.7. The market's limit order book immediately prior to Davenport's order is as follows:

Buyer	Bid Size	Limit Price(€)	Offer Size	Seller
Martin	4	25.6		
Smith	2	25.7		
Peterson	7	25.8		
		25.9	6	Hill
		26.0	8	Ali
		26.1	10	Khan

Davenport's average trade price is closest to:

- A. € 25.73
- B. € 25.78
- C. € 25.95

Davenport's sell order for 12 contracts will be executed starting with the most aggressively priced buy order. The first transaction will be with Peterson, who has a bid size of 7 contracts at a limit price of €25.8. This means that 7 out of 12 contracts will be sold to Peterson at this price. After this transaction, Davenport will have 5 contracts remaining to sell.

The next transaction will be with Smith, who has a bid size of 2 contracts at a limit price of €25.7. This is the next most aggressively priced buy order after Peterson's. Therefore, 2 out of the remaining 5 contracts will be sold to Smith at this price. After this transaction, Davenport will have 3 contracts remaining to sell.

However, the remaining 3 contracts will not be sold to Martin. This is because Martin's limit price of €25.6 is lower than Davenport's limit price of €25.7. In other words, Martin is not willing to pay as much as Davenport wants to sell for. Therefore, these 3 contracts will not be sold and will remain with Davenport.

Given these transactions, we can calculate Davenport's average trade price. The average trade price is calculated by dividing the total value of the contracts sold by the total number of contracts sold. In this case, the total value of the contracts sold is $(7 \text{ contracts} * €25.8) + (2 \text{ contracts} * €25.7) = €202.6 + €51.4 = €254$. The total number of contracts sold is $7 + 2 = 9$. Therefore, the average trade price is $€254 / 9 = €25.78$.

A is incorrect. Option A suggests that the average trade price is €25.73. However, this does not match with our calculation. The average trade price is calculated by dividing the total value of the contracts sold by the total number of contracts sold. In this case, the total value of the contracts sold is €254 and the total number of contracts sold is 9. Therefore, the average trade price is $€254 / 9 = €25.78$, not €25.73.

C is incorrect. Option C suggests that the average trade price is €25.95. However, this does not match with our calculation. The average trade price is calculated by dividing the total value of the contracts sold by the total number of contracts sold. In this case, the total value of the contracts sold is €254 and the total number of contracts sold is 9. Therefore, the average trade price is $€254 / 9 = €25.78$, not €25.95.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 1- Market Organization and Structure, LOS 1c: describe the major types of securities, currencies, contracts, commodities, and real assets that trade in organized markets, including their distinguishing characteristics and major subtypes.

Q.22 You are planning to invest \$3.5 million in a certain project. Incremental net cash flows are expected to be \$350,000 per year in perpetuity. The project's NPV, given a discount rate of 7%, is *most likely*?

- A. \$1,500,000
- B. \$2,000,000
- C. \$5,000,000

The NPV is the sum of the present values of cash inflows and outflows. In this case, the initial investment (cash outflow) is \$3.5 million, and the annual cash inflow is \$350,000. The discount rate used is 7%, which is represented as 0.07 in decimal form. The formula for NPV is as follows: $NPV = CF_0 + \frac{CF}{r}$, where CF_0 is the initial cash outflow, CF is the annual cash inflow, and r is the discount rate. Substituting the given values into the formula, we get $NPV = -3,500,000 + 350,000/0.07$, which simplifies to \$1,500,000. This calculation can also be done using a financial calculator by inputting the values as follows: $CF_0=-3.5$, $CF=0.35$, $F01=1,000$, and $I=7$. After inputting these values, the NPV function on the calculator will give the result as \$1.5 million.

B is incorrect. This option suggests that the NPV of the project is \$2,000,000. However, this does not align with the calculation done using the NPV formula. The NPV is calculated as the present value of the cash inflows minus the present value of the cash outflows. In this case, the present value of the cash inflows is less than the initial investment, resulting in a NPV of \$1,500,000, not \$2,000,000. Therefore, option B is incorrect.

C is incorrect. This option suggests that the NPV of the project is \$5,000,000. However, this is not the case. Option C seems to be confusing the concept of NPV with the present value of the project's cash flows. The present value of the project's cash flows would indeed be \$5,000,000 if the cash inflows were to continue indefinitely at a rate of \$350,000 per year with a discount rate of 7%. However, the NPV takes into account the initial investment, which in this case is \$3.5 million. Therefore, the NPV of the project is \$1,500,000, not \$5,000,000. Hence, option C is incorrect.

CFA Level 1, Topic 5 - Corporate Issuers, Learning Module 5 - Capital Investments and Capital Allocation, LOS 5b: 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.

Q.23 The exhibit illustrates a market's standing limit order book at market close.

Bid Sizes	Limit Prices	Ask Sizes
	70	15
	69	13
	68	11
	67	10
4	65	
5	64	
6	63	
8	62	

The market's bid and ask price are *closest to*:

- A. 67 bid and 65 ask.
- B. 65 bid and 67 ask.
- C. 65 bid and 70 ask.

A limit order book is a record of all outstanding limit orders, which are instructions to buy or sell a particular security at a specific price or better. The limit order book is divided into two sides: the bid side and the ask side. The bid side of the book lists all the limit orders to buy, arranged by price with the highest bid first. The ask side of the book lists all the limit orders to sell, arranged by price with the lowest ask first. This arrangement allows market participants to quickly identify the best bid and offer prices in the market.

In the given exhibit, the bid sizes, limit prices, and ask sizes are listed in separate columns. The bid sizes column is empty, which indicates that the orders are market orders and not limit orders. Market orders are instructions to buy or sell a security at the best available price in the current market, and they do not specify a price limit. The limit prices column is in descending order, which is typical for a limit order book as it allows the highest bid to be easily identified. The ask sizes column is in ascending order, which is also typical as it allows the lowest ask to be easily identified.

The best bid and offer are the highest bid and lowest ask, respectively. In the given exhibit, the highest bid is 65, and the lowest ask is 67. Therefore, the market's bid and ask price are closest to 65 bid and 67 ask.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 1- Market organization and structure, LOS 1h: compare market orders with limit orders.

Q.24 While identifying the target market during the process of index construction, which of the following is the *most appropriate* determining factor;

- A. Investment universe.
- B. The broadest definition of a market segment.
- C. Allocation to specific securities included in the index.

The target market is a crucial factor in determining the investment universe and the securities that are available for inclusion in the index. The investment universe refers to the pool of all possible investments that a fund can potentially invest in. This includes all types of securities such as stocks, bonds, commodities, currencies, and other financial instruments. The target market is a key determinant of the investment universe because it defines the scope of potential investments. For example, if the target market is the US, the investment universe would include all securities listed on US exchanges. Therefore, the investment universe is the most appropriate determining factor when identifying the target market during the process of index construction.

B is incorrect. The broadest definition of a market segment is not the most appropriate determining factor when identifying the target market during the process of index construction. While the broadest definition of a market segment is important in developing index construction, it does not directly determine the target market. The market segment refers to a group of securities that share similar characteristics, such as industry or sector. However, the target market is a broader concept that encompasses the entire investment universe, not just a specific market segment.

C is incorrect. The allocation to specific securities included in the index is not the most appropriate determining factor when identifying the target market during the process of index construction. The allocation to specific securities is a decision that is made after the target market and the investment universe have been identified. This involves deciding on the weightage of each security in the index, which is based on factors such as market capitalization, liquidity, and risk profile.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 2- Security market indexes, LOS 2c: describe the choices and issues in index construction and management.

Q.25 The exhibit below illustrates the details concerning an equity index

Security	Beginning of period price	Weight (%)	Shares outstanding	Dividends per share	End of period price
A	15.5	20	1,000	0.25	13.0
B	25.0	20	1,000	1.00	22.0
C	128.5	20	1,000	0.75	145.0
D	200.0	40	2,000	0.25	230.5
Total			5,000		

The price return of the index is *closest* to:

- A. 3.04%
- B. 4.33%
- C. 12.65%

The price return of the index is calculated by subtracting the beginning of period index value from the end of period index value, and then dividing the result by the beginning of period index value. This calculation gives the percentage change in the index value over the period.

The beginning of period index value is calculated by multiplying the beginning of period price of each security by the number of shares outstanding for that security, and then summing these products. In this case, the beginning of period index value is $(15.5 \times 1,000) + (25.0 \times 1,000) + (128.5 \times 1,000) + (200.0 \times 2,000) = 569,000$.

The end of period index value is calculated in a similar way, but using the end of period prices. In this case, the end of period index value is $(13.0 \times 1,000) + (22.0 \times 1,000) + (145.0 \times 1,000) + (230.5 \times 2,000) = 641,000$.

The price return is then $(641,000 / 569,000) - 1 = 0.1265$ or 12.65%.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 2 - Security market indexes, LOS 2b: calculate and interpret the value, price return, and total return of an index.

Q.26 Samson Electrics, a Dutch component manufacturer, has issued 3.2% non-callable, non-convertible, perpetual preferred shares with a par value of €1,000. The credit rating provided by Standard & Poor's is AA-, and the required return on identically rated preferred shares is 5.8%. The intrinsic value of the preferred share is *closest* to:

- A. € 551.72
- B. € 1,000.00
- C. € 1,812.50

The intrinsic value of a non-callable perpetual preferred stock can be calculated using the formula:

$$V_0 = \frac{D_0}{r}$$

Where:

- V_0 is the intrinsic value of the preferred stock,
- D_0 is the annual dividend,
- r is the required rate of return.

In this case:

- The dividend (D_0) is 3.2% of the par value of €1,000, so:
- $D_0 = 0.032 \times 1,000 = €32$
- The required rate of return (r) is 5.8%, or 0.058.

Substituting these values into the formula:

$$V_0 = \frac{32}{0.058} \approx €551.72$$

Therefore, the intrinsic value of the preferred share is €551.72. Since the share is non-callable and non-convertible, the dividends will be paid indefinitely, making the share a perpetuity. The intrinsic value represents the present value of all future dividends that will be paid on the share.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 8- Equity Valuation: Concepts and Basic tools, LOS 8g: calculate the intrinsic value of a non-callable, non-convertible preferred stock.

Q.27 A refinery company is going through some liquidity issues. To deal with the situation, the Chief Financial Officer of a company is exploring ways to benefit from stretching its payables for 15 days. The average payables of the company aggregate to \$875,000. The company incurs a borrowing cost of 6.5%. The costs of extending the payables for 15 days is *closest to*:

- A. \$2,337
- B. \$35,959
- C. \$56,875

The calculation is done by multiplying the average payables by the fraction of the number of days (15) over the total number of days in a year (365), and then by the borrowing cost. This gives us the cost of borrowing the same amount for 15 days, which is \$2,337. This is the cost that the company would save by stretching its payables for 15 days, hence it is the cost of extending the payables.

B is incorrect. The cost of extending the payables for 15 days is not \$35,959. This figure is significantly higher than the correct answer. It seems like this option might have been calculated using a different borrowing cost or a different number of days. However, based on the given borrowing cost of 6.5% and the 15-day period, the cost of extending the payables should be much lower, as calculated above.

C is incorrect. The cost of extending the payables for 15 days is not \$56,875. This figure is even higher than option B, and it is far from the correct answer. It is unclear how this figure was calculated, but it is not based on the given borrowing cost of 6.5% and the 15-day period. The cost of extending the payables, based on these parameters, should be much lower, as calculated above.

CFA Level 1, Topic 5 - Corporate Issuers, Learning Module 4- Working Capital and Liquidity, LOS 4b. explain liquidity and compare issuers' liquidity levels.

Q.28 A company plans to invest USD 7 million in a project. The project is expected to produce incremental net cash flows of USD 525,000 per year in perpetuity. If the company's opportunity cost of capital is 8.5%, then the net present value (NPV) of the project is *closest to*:

- A. -USD 6,475,000
- B. -USD 823,529
- C. USD 6,176,471

The net present value (NPV) of a project is a measure of the profitability of the project. It is calculated by subtracting the initial investment from the present value of the future cash flows. The present value of the future cash flows is calculated by dividing the annual cash flow by the discount rate. In this case, the initial investment is USD 7 million, the annual cash flow is USD 525,000, and the discount rate is 8.5%.

The formula for NPV is: $NPV = CF_0 + \frac{CF}{r}$, where CF_0 is the initial investment, CF is the annual cash flow, and r is the discount rate. Substituting the given values into the formula, we get: $NPV = -7,000,000 + 525,000/8.5\% = -USD 823,529$. This means that the present value of the future cash flows is less than the initial investment by USD 823,529. Therefore, the NPV of the project is -USD 823,529.

A is incorrect. This option suggests that the NPV of the project is -USD 6,475,000. However, this is not the case. The NPV is calculated by subtracting the initial investment from the present value of the future cash flows. In this case, the present value of the future cash flows is less than the initial investment by USD 823,529, not USD 6,475,000. Therefore, option A is incorrect.

C is incorrect. This option suggests that the NPV of the project is USD 6,176,471. However, this is not the case. The NPV is calculated by subtracting the initial investment from the present value of the future cash flows. In this case, the present value of the future cash flows is less than the initial investment, resulting in a negative NPV. Therefore, the NPV of the project cannot be a positive value, and option C is incorrect.

CFA Level 1, Topic 5 - Corporate Issuers, Learning Module 5- Capital Investments and Capital Allocation, LOS 5b: 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.

Q.29 Which of the following working capital management approaches *most likely* involves holding large positions in cash, receivables, and inventories relative to sales?

- A. Moderate approach.
- B. Aggressive approach.
- C. Conservative approach.

The conservative working capital management approach is characterized by a company maintaining large positions in cash, receivables, and inventories relative to sales. This approach is typically adopted by companies that prioritize financial stability and risk aversion over high returns. By holding substantial amounts of current assets, these companies ensure they have sufficient liquidity to meet their short-term obligations and unexpected expenses. This strategy provides the firm with significant financial flexibility, allowing it to manage and respond to unforeseen events effectively. However, it also means that a significant portion of the company's resources is tied up in non-productive assets, which could potentially limit its growth and profitability.

A is incorrect. The moderate approach to working capital management, represented by option A, involves a balance between the conservative and aggressive approaches. Under this approach, a company maintains a moderate level of current assets relative to sales. This means that the company tries to strike a balance between maintaining sufficient liquidity to meet its short-term obligations and minimizing the amount of resources tied up in non-productive assets. While this approach provides a certain level of financial flexibility, it does not involve holding large positions in cash, receivables, and inventories relative to sales, as the question suggests.

B is incorrect. The aggressive approach to working capital management, represented by option B, involves a company maintaining a low level of current assets relative to sales. This approach is typically adopted by companies that are willing to take on higher levels of risk in exchange for potentially higher returns. By minimizing the amount of funds committed to current assets, these companies free up resources that can be invested in profitable ventures. However, this approach reduces a company's financial flexibility and increases its vulnerability to unexpected expenses and short-term obligations. Therefore, it does not involve holding large positions in cash, receivables, and inventories relative to sales, as the question suggests.

CFA Level 1, Topic 5 - Corporate Issuers, Learning Module 4- Working Capital and Liquidity, LOS 4c: describe issuers' objectives and compare methods for managing working capital and liquidity.

Q.30 Smith Richards is an equity analyst following the stock of Horizon Limited, a company in the telecommunications sector. The company's balance sheet for the year 2016 is presented below. Richards aims to ascertain whether Horizon's stock is fairly valued. The company has 5,000 shares outstanding, which are trading on the market at a price of \$20.50.

Limited Financial Information for the Financial Year 2016

Cash	3,500
Accounts Receivable	25,000
Inventories	4,300
Net fixed assets	45,000
Total assets	77,800
Accounts Payable	10,100
Notes Payable	2,500
Common shareholder's equity	65,200
Total liabilities and equity	77,800

With the exclusion of net fixed assets, the market values of all assets and liabilities are equal to their book values. The market value of net fixed assets is 1.5 times its book value. Based on Horizon Limited's book value per share, Richards will most likely conclude that its stock is:

- A. Overvalued.
- B. Undervalued.
- C. Fairly valued.

Firstly, we need to calculate the market value of assets. The market value of assets is the sum of the market values of all individual assets. In this case, the market values of cash, accounts receivable, and inventories are given as \$3,500, \$25,000, and \$4,300 respectively. The market value of net fixed assets is given as 1.5 times its book value, which is \$45,000. Therefore, the market value of net fixed assets is \$67,500. Adding all these values, we get the total market value of assets as \$100,300.

Next, we calculate the market value of liabilities. The market value of liabilities is the sum of the market values of all individual liabilities. In this case, the market values of accounts payable and notes payable are given as \$10,100 and \$2,500 respectively. Adding these values, we get the total market value of liabilities as \$12,600.

Then, we calculate the adjusted book value. The adjusted book value is the difference between the market value of assets and the market value of liabilities. In this case, the adjusted book value is \$100,300 - \$12,600, which equals \$87,700.

Finally, we calculate the estimated value per share. The estimated value per share is the adjusted book value divided by the number of shares outstanding. In this case, the estimated value per share is \$87,700 / 5,000, which equals \$17.54.

Comparing the estimated value per share to the current market price of \$20.50, we can conclude that the Horizon Limited stock is overvalued. This is because the estimated value per share is less than the current market price.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 8- Equity Valuation: concepts and tools, LOS 8a: evaluate whether a security, given its current market price and a value estimate, is overvalued, fairly valued, or undervalued by the market.

Q.31 A firm's liquidity position has improved over the years after the joining of Mr. Aysuh, new Chief Financial Officer. Which of the following factors *least likely* contribute to the firm's improved liquidity position?

- A. Increased credit limits.
- B. Increasing days in receivables.
- C. Increasing days of accounts payable.

An increase in the days of receivables implies that the company is taking longer to collect payments from its customers. This delay in collection reduces the availability of funds, thereby negatively impacting the firm's liquidity position. Liquidity refers to the ability of a firm to meet its short-term financial obligations. When a firm has high liquidity, it means that it has a sufficient amount of cash or assets that can be quickly converted into cash to meet its immediate and short-term obligations. Therefore, any factor that reduces the availability of cash or makes it difficult to convert assets into cash will negatively impact the firm's liquidity.

A is incorrect. An increase in credit limits can actually contribute to improving a firm's liquidity position. This is because a higher credit limit allows a firm to borrow more funds, which can be used to meet its short-term financial obligations. Therefore, an increase in credit limits can provide a firm with more financial flexibility and improve its liquidity position. However, it's important to note that while an increase in credit limits can provide immediate liquidity, it also increases the firm's debt and can lead to higher interest expenses in the future.

C is incorrect. Increasing days of accounts payable implies that the firm is taking longer to pay its suppliers. While this might seem like a negative factor, it can actually improve a firm's liquidity position. This is because by delaying payments to suppliers, the firm is able to hold onto its cash for a longer period. This increases the availability of cash, thereby improving the firm's liquidity position. However, it's important to note that while delaying payments can improve liquidity in the short-term, it can strain relationships with suppliers and potentially lead to higher costs in the future if suppliers decide to charge late payment fees or refuse to offer credit terms in the future.

CFA Level 1, Topic 5 - Corporate Issuers, Learning Module 4- Working Capital and Liquidity, LOS 4b: explain liquidity and compare issuers' liquidity levels.

Q.32 Which of the following is specifically focused on the clauses within lending agreements that detail the actions issuers are obligated to perform or prohibited from performing?

- A. Covenants.
- B. Collaterals.
- C. Bond indenture.

Covenants are specifically designed to detail the obligations and restrictions that are imposed on issuers within lending agreements. These are the exact terms that allow creditors to specify the actions that issuers are obligated to perform or prohibited from performing. Covenants are a critical part of any lending agreement as they provide a framework for the relationship between the issuer and the creditor. They are designed to protect the interests of the creditor by ensuring that the issuer adheres to certain standards and practices. These can include maintaining certain financial ratios, limiting additional debt, or restricting asset sales. By doing so, covenants help to mitigate the risk of default and protect the creditor's investment.

B, Collaterals, is incorrect. Collaterals are assets or financial guarantees that an issuer pledges to secure its promise to repay its obligations. They are primarily used as a means of securing repayment rather than detailing specific terms of behavior or actions. While collaterals do provide a level of security for the creditor, they do not detail the actions that issuers are obligated to perform or prohibited from performing. Instead, they serve as a form of insurance for the creditor, providing a source of repayment should the issuer default on its obligations. Therefore, while collaterals are an important part of many lending agreements, they do not serve the same function as covenants.

C, Bond indenture, is incorrect. A Bond indenture is the legal contract that encompasses the entire set of terms and conditions of a bond issue, including covenants. However, it is not as specific as covenants in detailing the exact actions issuers must adhere to or avoid. The indenture contains all the details of the bond agreement, of which covenants are a critical, but singular part. It includes information such as the maturity date, interest rate, and other terms of the bond. While the bond indenture does include covenants, it also includes a wide range of other information, making it a broader document than the covenants themselves.

CFA Level 1, Topic 5 - Corporate Issuers, Learning Module 2 - Investors and Other Stakeholders, LOS 2b: describe a company's stakeholder groups and compare their interests.

Q.33 A trader purchases a share of stock on margin at its current market price of \$80. The initial margin requirement is 30%. The margin requirement for each share of stock is *closest* to:

- A. \$24
- B. \$56
- C. \$80

The margin requirement is the amount of equity a trader must maintain in their margin account and it is calculated as a percentage of the current market value of the stock. In this case, the margin requirement is calculated as 30% of \$80, which equals \$24. This is the minimum amount the trader must have in their account to hold the position. If the market price of the stock declines, the trader will incur a loss on the position. To prevent this from occurring, the trader should retain a minimum amount as equity in its position as a margin. This is why the margin requirement is set at a certain percentage of the current market price.

B is incorrect. This option suggests that the margin requirement for each share of stock is \$56. This is incorrect because it assumes that the margin requirement is calculated as the difference between 100% and the initial margin requirement (30%), multiplied by the current market price of the stock (\$80). This calculation is incorrect because the margin requirement is not the difference between the total value of the stock and the initial margin requirement. Instead, it is a percentage of the current market price of the stock. Therefore, the calculation should be 30% of \$80, not (100%-30%) of \$80.

C is incorrect. This option suggests that the margin requirement for each share of stock is equal to the current market price of the stock, which is \$80. This is incorrect because the margin requirement is not the same as the current market price of the stock. The margin requirement is a percentage of the current market price, not the entire amount. Therefore, the margin requirement cannot be equal to the current market price of the stock. This misunderstanding may arise from a lack of understanding of what a margin requirement is and how it is calculated.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 1 - Market Organization and Structure, LOS 1f: calculate and interpret the leverage ratio, the rate of return on a margin transaction, and the security price at which the investor would receive a margin call.

Q.34 Line Corporation will be investing €100 million in a new research facility. The facility is expected to generate cash flows of €30 million per year for the next eight years. The company's weighted average cost of capital is 7.5%. The line has 5 million shares outstanding, each of which has a current market price of €26.50. The company's earnings yield is 8.00%. The impact of the investment on Line's stock price is *most likely*:

- A. A decrease of € 1.77.
- B. An increase of € 15.14.
- C. An increase of € 41.64.

The NPV of the project is calculated using the cash flow and discount rate data provided in the question. The cash flow is €30 million per year for the next eight years and the discount rate, which is the company's weighted average cost of capital, is 7.5%. The NPV, which is the present value of these future cash flows discounted at the weighted average cost of capital, comes out to be €75.7191 million. This is the additional value that the project is expected to add to the company.

The market value of the company prior to undertaking the project is €132.50 million. This is calculated by multiplying the number of shares outstanding, which is 5 million, by the current market price of each share, which is €26.50. By undertaking the project, the value of the company should increase by the NPV of the project, which is €75.7191 million. This brings the total value of the company to €208.2191 million.

The impact of the investment on Line's stock price is calculated by dividing the increase in the company's value by the number of shares outstanding. This comes out to be €15.1438, which is approximately €15.14. Hence, the stock price is expected to increase by €15.14.

A is incorrect. This option suggests a decrease of € 1.77 in the stock price. However, as explained above, the investment is expected to increase the value of the company and hence increase the stock price. The calculation of the stock price impact does not result in a decrease, making this option incorrect.

C is incorrect. This option suggests an increase of € 41.64 in the stock price. While the investment is expected to increase the stock price, the calculated increase is €15.14, not €41.64. Therefore, this option is also incorrect.

CFA Level I, Topic 5 - Corporate Issuers, Learning Module 5 - Capital Investments and Capital Allocation, LOS 5b: 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.

Q.35 A fixed income analyst is studying the corporate bond sector in his country's fixed income market. After thorough analysis, he concludes that the value of an AAA-rated corporate bond placed by investors - based on their complete understanding of the bond's interest rate, principal value, and timing of its interest and principal payments - is 90. The bond is currently selling at a price of 120. Based on the results collected, the analyst can most likely conclude that:

- A. Market prices accurately reflect intrinsic values.
- B. Opportunities for profitable active investments exist.
- C. Investors will take long positions in AAA-rated corporate bonds.

The opportunities for profitable active investments exist. This conclusion is drawn from the fact that the intrinsic value of the bond, which is determined by investors' complete understanding of the bond's interest rate, principal value, and timing of its interest and principal payments, is lower than the bond's current market price. The intrinsic value is 90, while the market price is 120. This discrepancy indicates that the bond is overpriced in the market. Therefore, there is an opportunity for active investment, particularly through short-selling. In a short sale, an investor borrows a security and sells it on the open market, planning to buy it back later for less money. In this case, investors could short-sell these AAA-rated corporate bonds, selling them at the current market price, which is higher than their perceived intrinsic value. When the price of the bonds falls closer to their intrinsic value, the investors can buy them back at a lower price, making a profit from the difference.

A is incorrect. This option suggests that market prices accurately reflect intrinsic values. However, the given scenario clearly indicates a discrepancy between the market price and the intrinsic value of the AAA-rated corporate bond. The bond's intrinsic value, as determined by investors' understanding of its interest rate, principal value, and timing of payments, is 90. However, the bond is currently selling at a market price of 120. This discrepancy indicates that the market price does not accurately reflect the bond's intrinsic value. Therefore, the analyst cannot conclude that market prices accurately reflect intrinsic values.

C is incorrect. This option suggests that investors will take long positions in AAA-rated corporate bonds. However, the given scenario does not provide sufficient evidence to support this conclusion. While it is true that AAA-rated corporate bonds are generally considered safe investments due to their high credit rating, the fact that the bond in question is currently overpriced in the market suggests that investors may be more likely to short-sell the bond rather than take a long position. A long position involves buying a security with the expectation that its price will rise. However, in this case, the bond's market price is higher than its intrinsic value, indicating that its price is likely to fall, not rise. Therefore, the analyst cannot conclude that investors will take long positions in AAA-rated corporate bonds.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 3- Market efficiency, LOS 3b: contrast market value and intrinsic value.

Q.36 Which of the following is *most likely* the most effective way to measure industry profitability?

- A. By estimating the size of the industry
- B. By calculating the historical growth rate of the industry
- C. Through a time series of the distribution of returns on invested capital

Measuring industry profitability through a time series of the distribution of returns on invested capital (ROIC). The reason behind this is that ROIC is a profitability ratio that gauges how effectively a company uses its capital to generate profits. This is calculated by dividing net income by the total capital invested in the business. By analyzing a time series of the distribution of ROIC, one can gain insights into the profitability trends of an industry over time.

This method provides a more comprehensive understanding of industry profitability as it takes into account both the returns generated by companies in the industry and the capital invested to generate those returns. It also allows for comparisons across different industries, as it normalizes for differences in the size and capital structure of companies in different industries. This method is more effective than simply estimating the size of the industry or calculating the historical growth rate of the industry.

A is incorrect. Estimating the size of the industry does not effectively measure industry profitability. The size of an industry, whether in terms of its total revenue or total assets, does not provide information about the profitability of the companies within the industry. A large industry can be less profitable than a smaller one if the companies in the larger industry have lower profit margins or higher capital requirements. Hence, the size of the industry is not a reliable indicator of industry profitability.

B is incorrect. Calculating the historical growth rate of the industry is not the most effective way to measure industry profitability. While growth is an important aspect of a company's performance, it does not necessarily translate into profitability. A company or an industry can grow rapidly without being profitable, especially if the growth is driven by high levels of investment that do not generate sufficient returns. Hence, the historical growth rate of the industry does not provide a comprehensive measure of industry profitability.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 6 - Industry and Competitive Analysis, LOS 6c: determine an industry's size, growth characteristics, profitability, and market share trends.

Q.37 Which of the following is *most likely* the reason companies might hesitate to exercise a timing option in capital investments, even if delaying the project could provide better information?

- A. Fear of increased initial costs due to inflation.
- B. Concern about missing out on current market opportunities.
- C. Expectation of reduced flexibility in future decision-making.

Companies might hesitate to exercise a timing option in capital investments due to the fear of increased initial costs due to inflation. This hesitation is rooted in the understanding that delaying a project can lead to higher costs in the future. Inflation is a general increase in prices and fall in the purchasing value of money. When a company delays a project, it exposes itself to the risk of inflation. This means that the costs of resources required for the project, such as labor, materials, and equipment, may increase over time. As a result, the initial costs of the project could be higher than initially estimated, making the project less financially attractive. This fear of increased costs due to inflation can outweigh the potential benefits of obtaining better information and reducing uncertainty by delaying the investment decision.

B is incorrect. The concern about missing out on current market opportunities is indeed a valid consideration when deciding whether to delay a project. However, this concern typically becomes secondary if the fear of increased costs due to inflation is significant. While missing out on current market opportunities can have negative implications, such as lost revenues and market share, these potential losses are often difficult to quantify and predict with certainty. On the other hand, the impact of inflation on project costs can be more readily estimated and quantified, making it a more immediate and tangible concern for companies.

C is incorrect. The expectation of reduced flexibility in future decision-making is not a typical reason for companies to hesitate to exercise a timing option in capital investments. Contrary to this option, delaying a project often enhances future flexibility rather than reducing it. By postponing the investment decision, a company can gather more information about the project and its potential outcomes. This additional information can help the company make better-informed decisions, thereby increasing its flexibility in managing the project in the future. Therefore, the expectation of reduced future flexibility does not provide a compelling reason for companies to avoid delaying a project.

CFA Level 1, Topic 5 - Corporate Issuers, Learning Module 5 - Capital Investments and Capital Allocation, LOS 5d: describe types of real options relevant to capital investment.

Q.38 Green Associates does not currently pay dividends but is expected to do so at the end of the third year when the dividend per share is expected to be \$6.50 and will grow at a perpetual rate of 3% thereon. Green Associate's required rate of return is 10%. The intrinsic value of Green Associate's stock is *closest* to:

- A. \$71.86
- B. \$76.74

C. \$95.64

The intrinsic value of a stock can be calculated using the Gordon Growth Model, which determines the intrinsic value of a stock based on a future series of dividends that grow at a constant rate. In this case, Green Associates is expected to start paying dividends at the end of the third year, so we need to consider this when calculating the stock's value.

The Gordon Growth Model formula is:

$$V = \frac{D}{r - g}$$

Where:

- V is the value of the stock,
- D is the expected dividend,
- r is the required rate of return,
- g is the growth rate of the dividends.

In this case:

- Expected dividend, $D_0 = 6.50$,
- Growth rate, $g = 3\% = 0.03$,
- Required rate of return, $r = 10\% = 0.10$.

Step 1: Calculate the stock value at the end of the third year (V_3) when dividends begin to grow perpetually.

The formula to calculate the value at $t = 3$ is:

$$V_3 = \frac{D_0 \times (1 + g)}{r - g}$$

Substituting the given values:

$$V_3 = \frac{6.50 \times (1 + 0.03)}{0.10 - 0.03}$$

$$V_3 = \frac{6.50 \times 1.03}{0.07} = \frac{6.695}{0.07} \approx 95.6429$$

Step 2: Discount the value at t = 3 back to the present (t = 0).

We use the following formula to discount V₃ back to t = 0:

$$V_0 = \frac{V_3}{(1 + r)^3}$$

Substituting the given values:

$$V_0 = \frac{95.6429}{(1 + 0.10)^3}$$

$$V_0 = \frac{95.6429}{1.1^3} = \frac{95.6429}{1.331} \approx 71.86$$

Adding the present value of the \$6.50 dividend, which is calculated as \$6.50 / (1.10)³ = \$4.88, to the present value of the perpetual dividend stream, we get the intrinsic value of the stock: \$71.86 + \$4.88 = \$76.74.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 8 - Equity Valuation: Concepts and Basic Tools, LOS 8g: calculate the intrinsic value of a non-callable, non-convertible preferred stock.

Q.39 Which of the following characteristics are least likely unique to partially amortized bonds?

- A. Balloon payment at maturity.
- B. Entire payment of principal occurs at maturity.
- C. Periodic payments of interest and principal repayments based on a schedule.

Entire payment of principal occurs at maturity characteristic is not unique to partially amortized bonds. In fact, it is a characteristic of bullet bonds, not partially amortized bonds. A bullet bond is a type of bond where the entire principal is paid at once on the maturity date. Throughout the life of the bond, only interest payments are made. This is in contrast to partially amortized bonds, where periodic payments of both interest and principal are made, reducing the principal amount over time.

A is incorrect. The statement that a balloon payment is made at maturity is actually a characteristic of partially amortized bonds. In this type of bond, fixed periodic payments are made until maturity, but these payments do not fully cover the principal amount. Therefore, a larger payment, known as a balloon payment, is required at maturity to retire the bond's outstanding principal amount. This is a unique characteristic of partially amortized bonds, making option A incorrect.

C is incorrect. The statement that periodic payments of interest and principal repayments are made based on a schedule is also a characteristic of partially amortized bonds. These bonds are structured in such a way that the borrower makes regular payments of both interest and principal over the life of the bond, reducing the principal amount over time. This is in contrast to bullet bonds, where only interest payments are made during the life of the bond and the principal is paid in full at maturity. Therefore, option C is incorrect as this is a characteristic unique to partially amortized bonds.

CFA Level 1, Topic 6 - Fixed income, Learning Module 1 - Fixed-Income Instrument Features, LOS 1b: describe the contents of a bond indenture and contrast affirmative and negative covenants.

Q.40 Which of the following coupon payment structures will allow investors to benefit from an increase in interest rates?

- A. Inverse FRNs.
- B. Plain vanilla bonds.
- C. Floating rate notes (FRNs).

Floating rate notes (FRNs) allow investors to benefit from an increase in interest rates. FRNs are unique financial instruments where the coupon rate is adjusted periodically based on a reference interest rate. This means that when the reference interest rate increases, the coupon rate of the FRN also increases. This leads to a higher interest income for the investors. The direct linkage of the coupon rate to the prevailing interest rate allows investors to benefit from an increase in interest rates, making FRNs an attractive investment option during periods of rising interest rates.

A is incorrect. Inverse Floating Rate Notes (Inverse FRNs) have a coupon rate that moves in the opposite direction to the change in a reference interest rate. This means that when the reference interest rate increases, the coupon rate of the Inverse FRN decreases. This leads to a decrease in the interest income for the investors. Therefore, an increase in interest rates does not benefit investors of Inverse FRNs, but rather negatively impacts them by reducing their interest income. This makes Inverse FRNs a less attractive investment option during periods of rising interest rates.

B is incorrect. Plain vanilla bonds have a fixed coupon rate that does not change over the life of the bond. This means that the interest income for investors remains constant, regardless of changes in the interest rate. Therefore, an increase in interest rates does not benefit investors of plain vanilla bonds. In fact, it can negatively impact them as the market value of the bond decreases when interest rates increase. This is because the fixed coupon rate becomes less attractive compared to new bonds issued at the higher interest rate. Therefore, plain vanilla bonds are not an attractive investment option during periods of rising interest rates.

CFA Level 1, Topic 6 - Fixed Income, Topic 6, Learning Module 6 - Fixed-Income Bond Valuation: Prices and Yields, LOS 6b: identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.41 Which of the following types of fixed income security has the lowest degree of interest rate risk?

- A. Fixed-rate bond.
- B. Floating-rate bond.
- C. Inflation-indexed bond.

The floating-rate bond has the lowest degree of interest rate risk due to its unique feature of having a coupon rate that is periodically reset based on changes in the level of a reference rate. This means that the interest payments from a floating-rate bond adjust in response to changes in market interest rates. Therefore, the price of a floating-rate bond is less sensitive to changes in market interest rates compared to fixed-rate bonds or inflation-indexed bonds. This characteristic of floating-rate bonds provides a significant advantage in terms of reducing interest rate risk, which is the risk that a bond's price will decrease as a result of an increase in market interest rates.

A is incorrect. Fixed-rate bonds have a higher level of interest rate risk compared to floating-rate bonds. This is because the coupon rate of a fixed-rate bond remains constant throughout the life of the bond, regardless of changes in market interest rates. When market interest rates increase, the fixed interest payments of a fixed-rate bond become less attractive compared to newly issued bonds that offer higher interest payments. As a result, the price of the fixed-rate bond decreases to compensate for its lower yield. Therefore, investors who hold fixed-rate bonds are exposed to a higher degree of interest rate risk.

C is incorrect. Inflation-indexed bonds, while they do provide protection against inflation risk, do not necessarily have a lower degree of interest rate risk. The principal of an inflation-indexed bond is adjusted based on changes in the inflation rate, and the bond's coupon rate is applied to the adjusted principal to determine the interest payments. While this feature protects the bond's purchasing power against inflation, it does not protect the bond's price against changes in market interest rates. Therefore, inflation-indexed bonds can still be subject to interest rate risk, especially if market interest rates increase at a faster rate than the inflation rate.

CFA Level 1, Topic 6 - Fixed Income, Learning Module 6- Fixed-Income Bond Valuation: Prices and Yields, LOS 6b: identify the relationships among a bond's price, coupon rate, maturity, and yield-to-maturity.

Q.42 Lance Gibbons holds two fixed income securities, a corporate bond and a zero-coupon bond. Details concerning his investment are as follows:

- The zero-coupon bond matures in twelve years and is trading at a market discount rate of 5%.
- The corporate bond offers an annual coupon rate of 3.8%, matures in ten years, and is trading at a market discount rate of 4.2%.

Which of the following statements is *most likely* correct regarding his investments?

- A. Both bonds are selling at the same price.
- B. The corporate bond is trading at a lower price.
- C. The zero-coupon bond is trading at a discount of \$44.32 per \$100 of par value.

A zero-coupon bond, which matures in twelve years and is trading at a market discount rate of 5%, has a present value of \$55.68. This is calculated using the formula for the present value of a zero-coupon bond:

$$PV = \frac{FV}{(1 + r)^n}$$

Where:

- PV is the present value of the bond,
- FV is the future (or face) value of the bond,
- r is the discount rate,
- n is the number of periods (in this case, years).

Substituting the given values:

- FV = 100,
- r = 5% = 0.05,
- n = 12 years.

The present value of the bond is calculated as follows:

$$PV = \frac{100}{(1 + 0.05)^{12}}$$

First, calculate $(1 + 0.05)^{12}$:

$$(1.05)^{12} \approx 1.7959$$

Now, calculate the present value:

$$PV = \frac{100}{1.7959} \approx 55.68$$

This means the present value of the zero-coupon bond is approximately \$55.68.

Since the bond has a face value of \$100, it is trading at a discount of:

$$100 - 55.68 = 44.32$$

CFA Level I, Topic 6 - Fixed Income, Learning Module 18 - Asset Backed Security (ABS) Instrument and Market Features, LOS 18b: describe typical credit enhancement structures used in securitizations.

Q.43 Rachel Lake evaluates the potential for bond prices to change given the market discount rate. She derives the following conclusions: Conclusion 1: The convexity effect can be observed as the tendency for bond prices to increase when market discount rates decrease. Conclusion 2: For two bonds offering an identical coupon rate, the maturity effect results in the longer-term bond being more price-sensitive than a shorter-term bond when the change in market discount rates is identical. Lake is *most likely* correct with respect to:

- A. Conclusion 1 only.
- B. Conclusion 2 only.
- C. Both the conclusions.

Rachel Lake's Conclusion 2 is correct, while Conclusion 1 is incorrect.:

Conclusion 1 is incorrect. The convexity effect is not accurately described in this conclusion. The convexity effect in bond pricing refers to the phenomenon where the price of a bond changes asymmetrically with changes in the market discount rate. Specifically, the price of a bond increases more when the market discount rate decreases than it decreases when the market discount rate increases. This is due to the fact that the price-yield curve of a bond is convex, not linear. Therefore, the price-yield relationship is not symmetric, but rather, it exhibits positive convexity. This means that for a given change in yield, the increase in bond price when yields fall is greater than the decrease in bond price when yields rise. Hence, the statement that the convexity effect can be observed as the tendency for bond prices to increase when market discount rates decrease is not entirely accurate. The convexity effect is more about the asymmetric change in bond prices with respect to changes in market discount rates.

Conclusion 2 is correct. The maturity effect is accurately described in this conclusion. The maturity effect refers to the phenomenon where the price sensitivity of a bond to changes in market discount rates increases with the maturity of the bond. This is because the present value of the bond's cash flows, which constitute its price, is more sensitive to changes in the discount rate the further in the future these cash flows are received. Therefore, for two bonds with identical coupon rates, the longer-term bond will indeed be more price-sensitive than the shorter-term bond when the change in market discount rates is identical. This is because the present value of the longer-term bond's cash flows will be more affected by the change in the discount rate. Hence, the statement that the maturity effect results in the longer-term bond being more price-sensitive than a shorter-term bond when the change in market discount rates is identical is correct.

CFA Level I, Topic 6 - Fixed income, Learning Module 18- Asset Backed Security (ABS) Instrument and Market Feature, LOS 18b: describe typical credit enhancement structures used in securitizations.

Q.44 An investor purchases a five-year, 6% annual-coupon payment bond at 89.4535 per 100 of a value and sells it in four years. Following the purchase of the bond and prior to the receipt of the first coupon, interest rates go down to 8.5%. The realized yield on the bond investment is *closest* to:

- A. 3.77%
- B. 5.79%
- C. 8.71%

The future value of the reinvested coupons is 27.2371 per 100 of par value. This is calculated using the formula for the future value of an annuity, where each coupon payment is reinvested at the new interest rate of 8.5%. The formula is as follows:

$$[6 \times (1.085)^3] + [6 \times (1.085)^2] + [6 \times (1.085)^1] + 6 = 27.2371$$

Next, the sales price of the bond is calculated. The bond is sold at 97.6958 per 100 of par value. This is calculated by discounting the face value of the bond (which includes the final coupon payment) by the new interest rate of 8.5%. The formula is as follows:

$$\frac{106}{(1.085)^1} = 97.6958$$

The total return on the bond investment is then calculated by adding the future value of the reinvested coupons and the sales price of the bond. This gives a total return of 124.9329 (97.6958 + 27.2371). The realized yield is then calculated by solving for r in the following equation:

$$89.4535 = \frac{124.9329}{(1+r)^4}$$
$$\Rightarrow r = 0.08710$$

CFA Level 1, Topic 6 - Fixed Income, Learning Module 6 - Fixed-Income Bond Valuation: Prices and Yields, LOS 6a: calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.45 Green Associates owns a 3% semi-annual, coupon paying, 4-year bond issue with a par value of \$10,000 that is currently priced at \$9,783.14. The annualized yield to maturity of the issue is *closest* to:

- A. 1.79%
- B. 3.59%

C. 6.63%

The bond has the following characteristics:

- Face Value (FV) = \$10,000
- Present Value (PV) = -\$9,783.14
- Semi-annual coupon payment (PMT) = \$150 (which is 3% of \$10,000 divided by 2)
- Number of periods = 8 (4 years times 2 to account for semi-annual payments)

To calculate the Yield to Maturity (YTM), we need to determine the semi-annual yield first, then annualize it by multiplying it by 2. The YTM can be calculated by solving for the interest rate (r) in the bond pricing formula:

$$PV = PMT \times \left(1 - \frac{1}{(1 + r)^n}\right) / r + \frac{FV}{(1 + r)^n}$$

Where:

- PV = Present Value of the bond (or the price paid for the bond)
- PMT = Semi-annual coupon payment
- FV = Face Value of the bond
- r = Semi-annual yield (which we are solving for)
- n = Number of periods

Using a financial calculator or software to solve for r, we find that the semi-annual yield comes out to be approximately 1.7934%.

To annualize this yield, we multiply the semi-annual yield by 2:

$$YTM = 1.7934\% \times 2 = 3.59\%$$

Therefore, the Yield to Maturity (YTM) of the bond is 3.59%. This represents the annual rate of return earned on the bond if it is held until maturity, accounting for both the coupon payments and any capital gain or loss realized when the bond matures.

CFA Level I, Topic 6 - Fixed Income, Learning Module 1 - Fixed-Income Instrument Features, LOS 1a: describe the features of a fixed-income security.

Q.46 An 8.0% semi-annual coupon payment bond has an eight year maturity and is priced to yield 9.5%. The modified duration of the issue is 5.3515. The full price of the issue is 106.35. Ignoring the effects of convexity, the revised full price of the issue, if yields increase by 125 basis points, is *closest* to:

- A. \$96.58
- B. \$99.22
- C. \$116.12

The change in the full bond price is calculated using the following relationship:

$$\Delta\text{Price} = -\text{Modified Duration} \times \Delta\text{YTM}$$

Where:

- Modified Duration = 5.3515
- Change in Yield to Maturity (YTM) = 125 basis points = 0.0125

Substituting the values into the formula:

$$\Delta\text{Price} = -5.3515 \times 0.0125$$

$$\Delta\text{Price} = -0.0669$$

This means the bond price will decrease by approximately 6.7%, or 0.067 in decimal form.

CFA Level 1, Topic 6 - Fixed income, Learning Module 11 - Yield-Based Bond Duration Measures and Properties, LOS 11a: define, calculate, and interpret modified duration, money duration, and the price value of a basis point (PVBP).

Q.47 Alpha and Beta, manufacturing entities, are identical in all respects except for industry cyclicalities. Alpha operates in a cyclical industry, while Beta operates in a non-cyclical industry. If both companies increase their leverage levels by 10%, the credit risk will be:

- A. Higher for Beta.
- B. Nearly identical.
- C. Higher for Alpha.

The credit risk will be higher for Alpha. The reasoning behind this is that Alpha operates in a cyclical industry. Cyclical industries are those that are sensitive to the business cycle and economic conditions. They tend to do well when the economy is booming but suffer during economic downturns. This is because their products or services are often considered non-essential and therefore, their sales are more likely to fluctuate with the economy.

When a company like Alpha increases its leverage levels, it is essentially taking on more debt. While this can be beneficial in times of economic prosperity, it can also increase the company's risk during economic downturns. This is because the company will still need to service its debt, regardless of its income level. If the company's income decreases due to a downturn in the economy, it may struggle to meet its debt obligations, thereby increasing its credit risk.

On the other hand, Beta operates in a non-cyclical industry. These industries are less sensitive to economic conditions and their sales are more stable. Therefore, even if Beta also increases its leverage levels, its credit risk will not increase as much as Alpha's because its income is less likely to decrease significantly during an economic downturn.

A is incorrect. This option suggests that the credit risk will be higher for Beta. However, as explained above, companies in non-cyclical industries like Beta are less likely to experience significant decreases in income during economic downturns. Therefore, even if they increase their leverage levels, their credit risk will not increase as much as companies in cyclical industries like Alpha.

B is incorrect. This option suggests that the credit risk will be nearly identical for both Alpha and Beta. However, this is not the case. As explained above, the credit risk for a company in a cyclical industry like Alpha will increase more than a company in a non-cyclical industry like Beta when they both increase their leverage levels. This is because companies in cyclical industries are more sensitive to economic conditions and are therefore more likely to experience significant decreases in income during economic downturns.

CFA Level I, Topic 6 - Fixed Income, Learning Module 16- Credit Analysis for Corporate Issuers, LOS 16a: describe the qualitative and quantitative factors used to evaluate a corporate borrower's creditworthiness

Q.48 ABC Inc. has invested in a 5-year convertible bond issue trading at a price of \$1,050. The issue is convertible into the issuer's common shares at an exercise price of \$42. The exhibit gives the price of the issuer's stock over a five-day term.

Day	Price (\$)
1	36
2	32
3	42
4	40
5	34

Conversion parity will occur on day:

- A. 1
- B. 3
- C. 4

Conversion parity is a situation where the price of a convertible security is equal to the conversion value. The conversion value is calculated by multiplying the conversion ratio by the price of the underlying stock. The conversion ratio is the number of shares that can be obtained by converting the bond, and it is calculated by dividing the price of the convertible bond by the conversion price. In this case, the conversion ratio is 25, calculated as $\$1,050/\42 .

On day 3, the price of the underlying stock is \$42. Therefore, the conversion value on day 3 is $\$42 * 25 = \$1,050$. Since the price of the convertible bond is also \$1,050, conversion parity occurs on day 3 because the conversion value equals the bond price.

A is incorrect. This option suggests that conversion parity occurs on day 1. However, on day 1, the price of the underlying stock is \$36. Therefore, the conversion value on day 1 is $\$36 * 25 = \900 . Since the conversion value (\$900) is less than the price of the convertible bond (\$1,050), conversion parity does not occur on day 1.

C is incorrect. This option suggests that conversion parity occurs on day 4. However, on day 4, the price of the underlying stock is \$40. Therefore, the conversion value on day 4 is $\$40 * 25 = \$1,000$. Since the conversion value (\$1,000) is less than the price of the convertible bond (\$1,050), conversion parity does not occur on day 4.

CFA Level 1, Topic 6 - Fixed Income, Learning Module 2 - Fixed-Income Cash Flows and Types, LOS 2a: describe common cash flow structures of fixed-income instruments and contrast cash flow contingency provisions that benefit issuers and investors.

Q.49 Bonds that are issued by the government and backed by tax revenues are *least likely* known as:

- A. Sovereign bonds.
- B. Non-Sovereign bonds.
- C. Quasi-government bonds.

Quasi-government entities, such as public corporations or agencies, issue these bonds. Unlike the government, these entities do not have direct taxing authority. Instead, the repayment of these bonds comes from the cash flows generated from the project(s) that the bond issue is financing. This could include revenues from utilities, tolls, or other user fees. Therefore, these bonds are not directly backed by tax revenues, making them the least likely to be known as bonds issued by the government and backed by tax revenues.

A is incorrect. Sovereign bonds are issued by a national government. These bonds are backed by the government's taxing authority. This means that the government can use its power to collect taxes to generate revenues, which are then used to make interest payments and repay the principal on the bonds. Highly-rated sovereign bonds are often backed by excess revenues over expenditures, ensuring that the government has sufficient funds to meet its debt obligations. Therefore, sovereign bonds are directly linked to tax revenues, making them more likely to be known as bonds issued by the government and backed by tax revenues.

B is incorrect. Non-sovereign bonds are issued by entities that do not have sovereign status, such as local or regional governments, or public corporations. These bonds are financed by revenues collected by the taxing authority, along with other sources. This could include revenues from local taxes, fees, or charges. While these bonds are not issued by the national government, they are still backed by tax revenues to some extent. Therefore, non-sovereign bonds are more likely to be known as bonds issued by the government and backed by tax revenues, compared to quasi-government bonds.

CFA Level I, Topic 6 - Fixed Income, Learning Module 5- Fixed-Income Markets for Government Issuers, LOS 5a: describe funding choices by sovereign and non-sovereign governments, quasi-government entities, and supranational agencies

Q.50 Which of the following issues has the highest seniority ranking in the event of default?

- A. Subordinated.
- B. Senior unsecured.
- C. Senior subordinated.

In the event of a default, the issue with the highest seniority ranking is the Senior Unsecured debt. This is because senior unsecured debts are obligations that are not secured by a specific asset but are instead backed by the full faith and credit of the issuer. They are considered senior because, in the event of a default, they are among the first to be repaid, before other types of debt such as subordinated or junior debt. This is due to the fact that they have a higher claim on the issuer's assets and earnings. The senior unsecured debt holders have a higher priority in the event of liquidation or bankruptcy of the issuer. This means that they are more likely to recover their investment in the event of a default.

A is incorrect. Subordinated debt is a type of debt that is ranked below other debts in terms of claims on assets or earnings. In the event of a default, subordinated debt is only repaid after all other debts and obligations have been met. This means that the risk of loss for holders of subordinated debt is higher than for holders of senior debt. The subordinated debt holders are in a less favorable position compared to senior unsecured debt holders in the event of a default, as they have a lower claim on the issuer's assets and earnings.

C is incorrect. Senior subordinated debt is a type of debt that has a higher claim on assets and earnings than subordinated debt, but a lower claim than senior unsecured debt. In the event of a default, senior subordinated debt is repaid after senior unsecured debt but before subordinated debt. While it has a higher priority than subordinated debt, it still has a lower priority than senior unsecured debt. Therefore, in the event of a default, holders of senior subordinated debt are less likely to recover their investment than holders of senior unsecured debt.

CFA Level 1, Topic 6 - Fixed Income, Topic 6, Learning Module 16 - Credit Analysis for Corporate Issuers, LOS 16c: describe the seniority rankings of debt, secured versus unsecured debt and the priority of claims in bankruptcy, and their impact on credit ratings.

Q.51 A 180-day money market instrument is quoted at a discount rate of 0.476% for a 360-day year. The bond equivalent yield of the instrument is *closest* to:

- A. 0.476%
- B. 0.483%
- C. 0.494%

The bond equivalent yield is calculated as the difference between the face value and the purchase price, divided by the purchase price, and then multiplied by the ratio of the number of days in a year to the number of days to maturity.

The first step in the calculation is to determine the redemption amount per 100 of the par value of the instrument. This is calculated using the formula for the present value of a discount instrument, which is the face value multiplied by the difference between 1 and the product of the discount rate and the ratio of the number of days to maturity to the number of days in a year. In this case, the present value is calculated as 100 times the difference between 1 and the product of 0.00476 (the discount rate) and 0.5 (the ratio of 180 days to 360 days), which equals 99.762.

A is incorrect. This option suggests that the bond equivalent yield of the instrument is 0.476%, which is the same as the discount rate. However, the bond equivalent yield is not the same as the discount rate. The bond equivalent yield is a measure of the annualized return of a discount instrument, while the discount rate is the rate at which the instrument is discounted to its present value. Therefore, the bond equivalent yield is typically higher than the discount rate, as it takes into account the compounding effect of the return over the course of a year.

C is incorrect. This option suggests that the bond equivalent yield of the instrument is 0.494%. However, this is higher than the calculated bond equivalent yield of 0.483%. The bond equivalent yield is calculated using the formula mentioned above, and any deviation from this calculation would result in an incorrect yield. Therefore, option C is not the correct answer.

CFA Level 1, Topic 6 - Fixed Income, Learning Module 6- Fixed-Income Bond Valuation: Prices and Yields, LOS 6a: calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.52 The current market price of a three-year floating rate note (FRN) paying the six-month LIBOR plus 0.25% on a semi-annual basis is 98.70 per 100 of par value. The current six-month LIBOR is 1.05% and is expected to remain constant. Given that the interest payment each period is 0.650 per 100 of par value, the discount margin is *closest* to:

- A. 0.20%
- B. 0.70%
- C. 0.48%

$$PV = \frac{\frac{(Index+QM) \times FV}{m}}{(1 + \frac{Index+DM}{m})^1} + \frac{\frac{(Index+QM) \times FV}{m}}{(1 + \frac{Index+DM}{m})^2} + \dots + \frac{\frac{(Index+QM) \times FV}{m}}{(1 + \frac{Index+DM}{m})^N}$$

In this formula, PV represents the price of the floating-rate note (as a present value), Index is the annualized reference rate, QM is the annualized quoted margin, FV is the future value paid at maturity or the par value of the bond, m is the periodicity of the floating-rate note (the number of payment periods per year), DM is the annualized discount margin (required margin), and N is the number of evenly spaced periods to maturity.

From the information given in the question, we can substitute the values into the formula and solve for DM, the discount margin. The equation becomes:

$$98.70 = \frac{0.650}{1 + r} + \frac{0.650}{(1 + r)^2} + \frac{0.650}{(1 + r)^3} + \dots + \frac{(0.650 + 100)}{(1 + r)^6}$$

Using a financial calculator, we find that r equals 0.00873. Substituting this value back into the equation for r, we find that the discount margin (DM) equals 0.70%.

CFA Level 1, Topic 6 - Fixed Income, Learning Module 6- Fixed-Income Bond Valuation: Prices and Yields, LOS 6a: calculate a bond's price given a yield-to-maturity on or between coupon dates.

Q.53 The table below summarizes selective financial information concerning a textile manufacturer for the year 2013:

	(in thousand \$)
Net income from continuing operations	450
Depreciation and amortization	18
Capital expenditures	7
Increase in non-cash working capital	7
Gains from the sale of long-lived assets	12
Total debt	500

The manufacturer's FFO/total debt is *closest to*:

- A. 0.756
- B. 0.772
- C. 0.912

The manufacturer's FFO/total debt is closest to 0.912. This is calculated by first determining the Funds From Operations (FFO). The FFO is a measure of a company's operating cash flow that is primarily used in the real estate industry. It is calculated by adding depreciation and amortization to the net income and then subtracting any gains on sales of property. In this case, the FFO is calculated as follows: Net Income (\$450k) + Depreciation and Amortization (\$18k) - Gains on Sales of Property (\$12k) = \$456k. Then, to find the ratio of FFO to total debt, we divide the FFO by the total debt. In this case, the total debt is \$500k. Therefore, the FFO/total debt ratio is \$456k/\$500k = 0.912.

CFA Level I, Topic 6 - Fixed Income, Learning Module 4 - Fixed-Income Markets for Corporate Issuers, LOS 4a: compare short-term funding alternatives available to corporations and financial institutions.

Q.54 A limitation of using the current yield to evaluate fixed income security is that the measure ignores:

- A. weekends and holidays.
- B. the flat price of an issue.
- C. time value of coupon payments.

A limitation of using the current yield to evaluate fixed income security is that the measure ignores the time value of coupon payments. The current yield is a financial metric that is used to evaluate the effectiveness and profitability of an investment, particularly in the context of fixed income securities such as bonds. It is calculated by dividing the annual income generated by an investment by its current market price. However, this measure has a significant limitation in that it does not take into account the time value of coupon payments. The time value of money is a fundamental concept in finance, which posits that money available at the present time is worth more than the same amount in the future due to its potential earning capacity. Therefore, by ignoring the time value of coupon payments, the current yield may provide an inaccurate representation of the true profitability and effectiveness of a fixed income security.

A is incorrect. This option suggests that the current yield ignores weekends and holidays. However, this is not accurate. The current yield is a measure of the annual income generated by an investment relative to its current market price, and as such, it is not influenced by the occurrence of weekends or holidays. The street convention yield-to-maturity, another measure used in the evaluation of fixed income securities, is known to ignore weekends and holidays, but this is not applicable to the current yield.

B is incorrect. This option suggests that the current yield ignores the flat price of an issue. However, this is not accurate. The current yield is calculated by dividing the annual income generated by an investment by its current market price, also known as the flat price. Therefore, far from ignoring the flat price, the current yield is directly dependent on it. The flat price of an issue is a crucial component in the calculation of the current yield, and any changes in the flat price will directly impact the current yield.

CFA Level I, Topic 6 - Fixed Income, Learning Module 18 - Asset-Backed Security (ABS) Instrument and Market Features, LOS 18c: describe types and characteristics of non-mortgage asset-backed securities, including the cash flows and risks of each type.

Q.55 A US treasury Bill (US T-Bill) with a par value of USD 1,000,000 and 200 days until maturity is selling for USD 990,000. Its bank discount rate is closest to:

- A. 0.54%
- B. 1.80%
- C. 1.82%.

The formula for the bank discount yield is as follows:

$$PV = FV \times [1 - \frac{\text{Days}}{\text{Year}} \times DR]$$

In this formula, PV represents the current selling price of the T-Bill, FV represents the par value of the T-Bill, and DR represents the discount rate. By substituting the given values into the formula, we get:

$$990,000 = 1,000,000 \times [1 - \frac{200}{360} \times DR]$$

From this equation, we can solve for DR, which gives us 1.8%. This is the bank discount yield, which is the annualized return based on the purchase price of the bill and the amount received at maturity. It is calculated on a 360-day year, which is a common assumption in the financial industry.

A is incorrect. This option incorrectly divides the number of days in a year by the days to maturity. The formula used in this option is:

$$1,000,000 \times [1 - \frac{360}{200} \times DR] = 990,000$$

When solved for DR, this gives a discount rate of 0.54%. However, this is not the correct way to calculate the bank discount yield. The number of days in a year should be divided by the number of days until maturity, not the other way around.

C is incorrect. This option assumes a 365-day year, which is not the standard assumption in the financial industry. The formula used in this option is:

$$990,000 = 1,000,000 \times [1 - \frac{200}{365} \times DY]$$

When solved for DY, this gives a discount rate of 1.82%. However, this is not the correct way to calculate the bank discount yield. The standard assumption in the financial industry is a 360-day year, not a 365-day year.

CFA Level I, Topic 6 - Fixed Income, Learning Module 6- Fixed-Income Bond Valuation: Prices and Yields, LOS 6a: calculate a bond's price given a yield-to-maturity on or between coupon dates

Q.56 James Cunningham is evaluating the factors that influence issue ratings. He has identified and described two factors which he has summarized below: Factor 1: The higher the senior unsecured ranking, the lower the notching adjustment will be. Factor 2: In the case of structural subordination, the debt of the parent holding company is serviced before that of operating subsidiaries. Cunningham is *most likely* correct with respect to:

- A. factor 1 only.
- B. factor 2 only.
- C. both of the factors.

James Cunningham's statement regarding Factor 1 is accurate. The notching adjustment, which is a method used by credit rating agencies to differentiate risk levels among different debt instruments issued by the same entity, indeed decreases as the seniority of unsecured debt increases. This is because the senior unsecured ranking is a measure of the priority of a debt in the event of bankruptcy or liquidation. The higher the senior unsecured ranking, the more likely the debt will be repaid in full in the event of a default. As a result, the perceived risk of default decreases with higher senior unsecured rankings, reducing the need for a notching adjustment to capture potential differences in loss severity. This explains why the notching adjustment will be lower for debts with a higher senior unsecured ranking.

B is incorrect. Cunningham's statement regarding Factor 2 is incorrect. In the case of structural subordination, the debt of the operating subsidiaries is serviced before the debt of the parent holding company, not the other way around. This is because the cash flows and assets of the subsidiaries are used to service the debt at the subsidiary level first. Only after the subsidiary's obligations have been met can funds be passed up to the holding company to service its debt. Therefore, in a situation of structural subordination, the parent company's debt is at a higher risk of default than the subsidiary's debt.

C is incorrect. As explained above, while Cunningham is correct about Factor 1, he is incorrect about Factor 2.

CFA Level I, Topic 6 - Fixed Income, Learning Module 16- Credit Analysis for Corporate Issuers, LOS 16c: describe the seniority rankings of debt, secured versus unsecured debt and the priority of claims in bankruptcy, and their impact on credit ratings.

Q.57 The value of European call option is inversely related to the:

- A. Exercise price.
- B. Time to expiration.
- C. Value of the underlying.

The exercise price is a crucial factor in determining whether an option buyer will exercise the option at the expiration. The payoff of a call option at maturity is given by the formula $\max(0, S_T - X)$. This formula implies that the higher the exercise price (X), the lower the payoff, and consequently, the lower the value of the call option. This is because a higher exercise price reduces the likelihood of the option being in the money at expiration, thus reducing its value. Conversely, a lower exercise price increases both the likelihood of exercise and the settlement value if the option is in the money, thereby increasing the value of the call option.

B is incorrect. This option suggests that the value of a European call option is inversely related to the time to expiration. However, this is not accurate. The time value of an option represents the likelihood that favorable changes to the underlying price will increase the profitability of the exercise. For both call and put options, a longer time to maturity increases the likelihood of the option finishing in the money, thus increasing the option's value. Therefore, the value of a European call option is directly, not inversely, related to the time to expiration.

C is incorrect. This option proposes that the value of a European call option is inversely related to the value of the underlying. However, this is not the case. The value of the underlying has a direct impact on the right to exercise an option. For a call option, it is exercisable if $S_T > X$. As such, the value of the call option appreciates when the spot price of the underlying increases. Therefore, the value of a European call option is directly, not inversely, related to the value of the underlying.

CFA Level 1, Topic 7 - Derivatives, Learning Module 8 - Pricing and Valuation of Options, LOS 8c: Identify the factors that determine the value of an option and describe how each factor affects the value of an option.

Q.58 Consider a call option with a premium of \$21 and a strike price of \$198. The maximum possible profit for the writer of the call is *closest to*:

- A. \$21
- B. \$177
- C. \$198

The writer of a call option can only profit up to the amount of the premium they receive for selling the option. In this case, the premium is \$21, so that is the maximum profit the writer can make. This is true regardless of the underlying asset's price, as the writer keeps the premium no matter what. Even if the asset's price falls below the strike price, the writer still keeps the premium. This is the fundamental principle of options writing, where the writer takes on the risk of potential losses in exchange for the certain gain of the premium.

B is incorrect. This option suggests that the maximum possible profit for the writer of the call is \$177. This is not possible because the writer of a call option cannot make a profit that exceeds the premium they receive for selling the option. Even if the underlying asset's price falls significantly below the strike price, the writer's profit is still capped at the premium amount. Therefore, a profit of \$177 is not possible in this scenario.

C is incorrect. This option suggests that the maximum possible profit for the writer of the call is \$198. This is also not possible because, as explained above, the writer's profit is capped at the premium amount. The strike price of the option does not affect the writer's profit, as they keep the premium regardless of whether the asset's price is above or below the strike price. Therefore, a profit of \$198 is not possible in this scenario.

CFA Level 1, Topic 7 - Derivatives, Learning Module 2- Forward Commitment and Contingent Claim Features and Instruments, LOS 2b: determine the value at expiration and profit from a long or a short position in a call or put option.

Q.59 A U.S.-based company has a subsidiary in Germany from which it expects to receive €8 million in the next 3 months. If the company's management is concerned about foreign currency, it will *most likely* enter into a:

- A. Currency forward contract by taking a short position in the €.
- B. Currency forward contract by taking a short position in the \$.
- C. Forward rate agreement (FRA) by taking a long position in the €.

The company is expecting to receive €8 million from its subsidiary in Germany. This means that the company is long the €, as it will be receiving this currency in the future. To protect itself from potential foreign currency risk, the company needs to sell those € to convert them into \$. This is achieved by taking a short position in the € through a currency forward contract. In this scenario, the company is essentially selling € that it does not currently own, with the expectation that it will own them in the future when it receives the payment from its subsidiary. This allows the company to lock in a specific exchange rate now, protecting it from potential future fluctuations in the €/\$ exchange rate.

B is incorrect. This option suggests that the company should take a short position in the \$, which is not the correct approach in this scenario. Taking a short position in the \$ would mean that the company is selling \$ that it does not currently own, with the expectation that it can buy them back at a lower price in the future. However, in this scenario, the company is not concerned about the value of the \$, but rather the value of the €. Therefore, taking a short position in the \$ would not provide the company with the protection it needs against potential fluctuations in the €/\$ exchange rate.

C is incorrect. This option suggests that the company should enter into a Forward Rate Agreement (FRA) by taking a long position in the €. However, FRAs are typically used for hedging interest rate risk, not foreign currency risk. In an FRA, the underlying asset is an interest rate, not a currency. Therefore, entering into an FRA would not provide the company with the protection it needs against potential fluctuations in the €/\$ exchange rate. Furthermore, taking a long position in the € would mean that the company is buying € with the expectation that the value of the € will increase, which is not the company's concern in this scenario.

CFA Level 1, Topic 7 - Derivatives, Learning Module 2- Forward Commitment and Contingent Claim Features and Instruments, LOS 2a: define forward contracts, futures contracts, options (calls and puts), swaps, and credit derivatives and compare their basic characteristics.

Q.60 John Cabbot, a derivatives trader at AFK Bank, takes a long position in the 200,000 June 2019 gold futures contract. Which of the following parties will *most likely* have the opposite position to the futures contracts?

- A. A clearinghouse.
- B. A mix of retail traders and investors.
- C. Other derivative traders at large banks.

A clearinghouse acts as a third party to all futures and options contracts. They are the buyers to every clearing member seller and the sellers to every clearing member buyer. This means that when John Cabbot, a derivatives trader at AFK Bank, takes a long position in the 200,000 June 2019 gold futures contract, the clearinghouse will most likely have the opposite position to the futures contracts. This is because the clearinghouse is the entity that facilitates the transaction and ensures that the contract is fulfilled. They take on the risk of the transaction, ensuring that both parties fulfill their obligations. Therefore, the clearinghouse is the most likely party to have the opposite position to the futures contracts.

B is incorrect. While it is true that a mix of retail traders and investors participate in futures trading, they do not necessarily have the opposite position to the futures contracts. Retail traders and investors can take either a long or short position in a futures contract, depending on their investment strategy and market outlook. Therefore, it is not guaranteed that they will have the opposite position to John Cabbot's long position in the gold futures contract. Furthermore, retail traders and investors do not act as a third party to all futures and options contracts, unlike a clearinghouse.

C is incorrect. Other derivative traders at large banks could potentially have the opposite position to the futures contracts, but this is not a certainty. Like retail traders and investors, other derivative traders can take either a long or short position in a futures contract, depending on their investment strategy and market outlook. Therefore, it is not guaranteed that they will have the opposite position to John Cabbot's long position in the gold futures contract. Moreover, other derivative traders at large banks do not act as a third party to all futures and options contracts, unlike a clearinghouse.

CFA Level 1, Topic 7 - Derivatives, Learning Module 2- Forward Commitment and Contingent Claim Features and Instruments, LOS 2a: define forward contracts, futures contracts, options (calls and puts), swaps, and credit derivatives and compare their basic characteristics.

Q.61 Call options are primarily purchased by investors who are:

- A. bullish.
- B. bearish.
- C. risk-averse.

Call options are a type of financial derivative that gives the holder the right, but not the obligation, to buy an asset at a specified price within a certain period of time. The key characteristic of call options is their unlimited upside profit potential. This means that if the price of the underlying asset increases significantly, the holder of the call option can make a substantial profit. This is because they have the right to buy the asset at the lower, predetermined price and can then sell it at the higher market price. The only loss to the holder of the call option is the premium paid to purchase the option, which is a fixed amount. This characteristic of call options makes them particularly attractive to bullish investors, those who anticipate an increase in the price of the underlying asset. Therefore, option A is the correct answer.

B is incorrect. Bearish investors, on the other hand, expect the price of the asset to decrease. They would not benefit from purchasing a call option, as they would not want to exercise their right to buy the asset at a higher price than the market price. Instead, bearish investors might consider purchasing a put option, which gives them the right to sell an asset at a predetermined price. If the price of the asset decreases, they can buy the asset at the lower market price and then sell it at the higher predetermined price, making a profit. Therefore, purchasing a call option would not align with the expectations and strategies of bearish investors.

C is incorrect. Risk-averse investors prefer investments that have low risk, even if they also have low returns. They prefer to know the risks associated with their investments upfront and to limit these risks as much as possible. Call options, with their unlimited upside potential, also come with the risk of losing the entire premium paid to purchase the option. This risk, combined with the uncertainty of whether the price of the underlying asset will increase, makes call options less suitable for risk-averse investors. They would likely prefer more predictable investments, such as bonds or index funds.

CFA Level 1, Topic 7 - Derivatives, Learning Module 2 - Forward Commitment and Contingent Claim Features and Instruments, LOS 2a: define forward contracts, futures contracts, options (calls and puts), swaps, and credit derivatives and compare their basic characteristics.

Q.62 A three-month call option with an exercise price of \$38 is being sold for \$ 6.50. The underlying is currently worth \$42, and the risk-free rate is 3%. Assuming the put-call parity holds, a put option is being sold for:

- A. \$2.22
- B. \$6.50

C. \$10.19

The put-call parity formula, which is a fundamental principle in options pricing, is expressed as:

$$c_0 + \frac{X}{(1+R)^T} = S_0 + p_0$$

Where:

- c_0 is the price of the call option,
- X is the exercise (strike) price,
- R is the risk-free rate,
- T is the time to maturity,
- S_0 is the price of the underlying asset,
- p_0 is the price of the put option.

To solve for p_0 , we rearrange the formula as follows:

$$p_0 = c_0 + \frac{X}{(1+R)^T} - S_0$$

Substituting the given values into the formula:

- $c_0 = 6.50$,
- $X = 38$,
- $R = 3\% = 0.03$,
- $T = 0.25$ years (3 months),
- $S_0 = 42$.

Now, calculate the discounted value of the exercise price:

$$\frac{38}{(1+0.03)^{0.25}} \approx \frac{38}{1.0074} \approx 37.73$$

Substitute this value into the equation for p_0 :

$$p_0 = 6.50 + 37.73 - 42$$

$$p_0 = 2.23$$

Therefore, the price of the put option (p_0) is approximately \$2.23. This calculation assumes that the put-call parity holds, maintaining the relationship between the prices of the call option, the put option, and the underlying asset.

CFA Level 1, Topic 7 - Derivatives, Learning Module 2- Forward Commitment and Contingent Claim Features and Instruments, LOS 2b: determine the value at expiration and profit from a long or a short position in a call or put option.

Q.63 An investor that enters into a long equity forward contract on a total return stock index will be concerned about the management of:

- A. Price risk.
- B. The uncertainty of dividends.
- C. Both price risk and uncertainty of dividends.

An investor entering into a long equity forward contract on a total return stock index will be concerned about both price risk and the uncertainty of dividends. This is because both these factors significantly influence the value and potential return of the investment.

Price risk is a major concern for investors in a long equity forward contract on a total return stock index. This risk refers to the potential loss an investor may incur due to changes in the price of an asset. In this case, the asset is the total return stock index. The value of this index and the forward contract payoff are directly affected by changes in the prices of the underlying stocks. If the prices of these stocks decrease, the value of the index will also decrease, leading to a lower payoff from the forward contract. This can result in a loss for the investor, hence the concern about price risk.

A is incorrect. While it is true that price risk is a concern for an investor in a long equity forward contract on a total return stock index, it is not the only concern. The investor also needs to consider the uncertainty of dividends, which is not accounted for in option A.

The uncertainty of dividends is another significant concern for investors in a long equity forward contract on a total return stock index. This refers to potential changes in the amount or timing of dividends paid by the companies included in the stock index. Dividends are a key component of the total return on the index and the forward contract payoff. Any changes to dividends, whether in terms of amount or timing, would affect the overall return on the investment. If the dividends decrease or are delayed, the investor's return from the investment will be lower than expected.

B is incorrect. Similar to option A, option B only addresses one aspect of the concerns an investor in a long equity forward contract on a total return stock index would have. While the uncertainty of dividends is indeed a concern, it is not the only one. The investor also needs to consider price risk, which is not mentioned in option B.

CFA Level 1, Topic 8 - Derivatives, Learning Module 5- Pricing and Valuation of Forward Contracts and for an Underlying with Varying Maturities, LOS 5a: explain how the value and price of a forward contract are determined at initiation, during the life of the contract, and at expiration.

Q.64 A long-term European put option will always be worth more than an otherwise identical short-term put option if:

- A. volatility is lower.
- B. interest rates are lower.
- C. interest rates are higher.

A long-term European put option will always be worth more than an otherwise identical short-term put option if interest rates are lower. The reasoning behind this is that lower interest rates increase the present value of the strike price, which in turn increases the intrinsic value of the put option. This effect is more pronounced in long-term options due to their longer duration. The longer the duration of the option, the more time there is for the interest rate to affect the present value of the strike price. Therefore, a decrease in interest rates will have a greater impact on the value of a long-term put option compared to a short-term put option, making the long-term put option more valuable.

A is incorrect. This option suggests that a long-term European put option will always be worth more than an otherwise identical short-term put option if volatility is lower. However, this is not accurate. Higher volatility actually increases the value of both long-term and short-term options. This is because volatility represents the degree of variation of a trading price series over time. The higher the volatility, the more the underlying asset's price can fluctuate significantly over time. This increased potential for price fluctuation can increase the value of an option. However, the effect of volatility is more pronounced on long-term options because there is more time for the underlying asset's price to fluctuate significantly.

C is incorrect. This option suggests that a long-term European put option will always be worth more than an otherwise identical short-term put option if interest rates are higher. However, this is not accurate. Higher interest rates actually decrease the value of put options. This is because higher interest rates decrease the present value of the strike price, which in turn decreases the intrinsic value of the put option. However, even with higher interest rates, a long-term put option can still be more valuable than a short-term put option. This is due to the longer time horizon of the long-term put option, which allows for more potential downside movement in the underlying asset's price. Despite the decrease in value caused by higher interest rates, the potential for greater downside movement can still make the long-term put option more valuable than the short-term put option.

CFA Level 1, Topic 8 - Derivatives, Learning Module 2- Forward Commitment and Contingent Claim Features and Instruments, LOS 2c: contrast forward commitments with contingent claims.

Q.65 Carlson Smith has invested in an FD hedge fund with \$450 million under management. The fund charges a 2% management fee based on the funds under management at year-end. A 20% incentive fee, calculated net of the management fee, is earned over a 6% hurdle rate. FD hedge fund appreciated by 10% over the course of the year. Smith's net-of-fees return is *closest* to:

- A. 7.44%
- B. 9.64%
- C. 9.76%

This is calculated by first determining the fund value at the end of the year, which is \$495 million. This is obtained by multiplying the initial investment of \$450 million by the appreciation rate of 10% (i.e., \$450 million * 1.10 = \$495 million).

Next, the management fee is calculated. The management fee is 2% of the fund value at the end of the year, which is \$9.90 million (i.e., \$495 million * 0.02 = \$9.90 million). This fee is deducted from the fund value at the end of the year.

The hurdle amount is then calculated. The hurdle amount is the minimum return that the hedge fund must achieve before it can charge an incentive fee. In this case, the hurdle rate is 6% of the initial investment, which is \$27 million (i.e., \$450 million * 0.06 = \$27 million).

The incentive fee is calculated next. The incentive fee is 20% of the fund's return above the hurdle amount, net of the management fee. In this case, the incentive fee is \$1.62 million (i.e., (\$495 million - \$450 million - \$9.90 million - \$27 million) * 0.20 = \$1.62 million).

Finally, Smith's net return is calculated by subtracting the management fee and the incentive fee from the fund value at the end of the year, and then dividing by the initial investment. This gives a net return of 7.44% (i.e., (\$495 million - \$450 million - \$9.90 million - \$1.62 million) / \$450 million = 0.0744 = 7.44%).

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 1- Alternative Investment Features, Methods, and Structures, LOS 1c: describe investment ownership and compensation structures commonly used in alternative investments.

Q.66 A desirable characteristic of alternative investments is *most likely*:

- A. Liquidity.
- B. Transparency.
- C. Low correlation with traditional investments.

Alternative investments are often pursued as a method to diversify a portfolio and mitigate overall risk. The primary way they accomplish this is through a low correlation with traditional investments, such as stocks and bonds. A low correlation implies that the returns of the alternative investment do not move in the same direction or at the same magnitude as traditional investments. This characteristic can aid in reducing the volatility of a portfolio and smoothing out returns over time.

A is incorrect. Liquidity is a desirable characteristic of any investment, as it allows for easy entry and exit from the investment. However, alternative investments are often illiquid, meaning they cannot be easily bought or sold without a substantial change in price. This illiquidity can make it difficult for investors to exit the investment when they want to, which can be particularly problematic in times of market stress. Therefore, while liquidity is generally a desirable characteristic, it is not typically associated with alternative investments.

B is incorrect. Transparency is another desirable characteristic of investments, as it allows investors to understand the underlying assets and risks associated with the investment. However, alternative investments often lack transparency. This lack of transparency can make it difficult for investors to fully understand the risks associated with the investment, and can also make it more difficult for investors to accurately value the investment. Therefore, while transparency is generally a desirable characteristic, it is not typically associated with alternative investments.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 1- Alternative Investment Features, Methods, and Structures, LOS 1a: describe features and categories of alternative investments

Q.67 Which of the following is *least likely* a valid reason for investing in real estate?

- A. Inflation hedging potential.
- B. Likelihood of diversification benefits.
- C. Limited involvement in the operational management of properties.

A valid reason for investing in real estate is the limited involvement in the operational management of properties. This is not typically considered a valid reason for investing in real estate. Real estate investment often requires a significant amount of involvement in the operational management of properties. This involvement can range from making decisions about property improvements, to dealing with tenants and handling any issues that arise. Even if an investor hires a property management company, they still need to be involved in some capacity, such as making final decisions on tenant selection, approving major expenses, and being responsible for the overall strategy of the property.

A is incorrect. Inflation hedging refers to the ability of an investment to keep up with the pace of inflation, thereby preserving the purchasing power of the investor's money. Real estate is often considered a good hedge against inflation because property values and the income from rental properties tend to increase with inflation. Therefore, the potential for inflation hedging is a valid reason for investing in real estate, making option A incorrect.

B is incorrect. Diversification is a risk management strategy that involves spreading investments across various different types of assets to reduce exposure to any one particular asset. Real estate is often used in a diversified investment portfolio because it tends to have a low correlation with other major asset classes. This means that when other assets are performing poorly, real estate may perform well, thereby reducing the overall risk of the investment portfolio. Therefore, the likelihood of diversification benefits is a valid reason for investing in real estate, making option B incorrect.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 4 - Real Estate and Infrastructure, LOS 4b: explain the investment characteristics of real estate investments.

Q.68 An analyst gathered the following information regarding a fund:

- Total shares outstanding: 500,000 shares
- Assets: \$1,000,000
- Liabilities: \$300,000

The net asset value (NAV) of the fund is *closest to*:

- A. \$0.60
- B. \$1.40
- C. \$2.00

The net asset value (NAV) of a fund is calculated by subtracting the fund's liabilities from its assets and then dividing the result by the total number of shares outstanding. In this case, the assets are \$1,000,000 and the liabilities are \$300,000, which leaves us with \$700,000. This amount is then divided by the total number of shares outstanding, which is 500,000. The result of this calculation is \$1.40. This is the correct NAV of the fund, which is why option B is the correct answer.

A is incorrect. The calculation assumed in option A is incorrect because it only considers the liabilities of the fund, which are \$300,000, and divides this amount by the total number of shares outstanding, which is 500,000. The result of this calculation is \$0.60. However, this is not the correct way to calculate the NAV of a fund. The NAV is calculated by subtracting the fund's liabilities from its assets, not just considering the liabilities. Therefore, option A is incorrect because it does not correctly calculate the NAV of the fund.

C is incorrect. The calculation assumed in option C is incorrect because it only considers the assets of the fund, which are \$1,000,000, and divides this amount by the total number of shares outstanding, which is 500,000. The result of this calculation is \$2.00. However, this is not the correct way to calculate the NAV of a fund. The NAV is calculated by subtracting the fund's liabilities from its assets, not just considering the assets. Therefore, option C is incorrect because it does not correctly calculate the NAV of the fund.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 2- Alternative Investment Performance and Returns, LOS 2b: calculate and interpret alternative investment returns both before and after fees.

Q.69 Brian Ross is a wealthy entrepreneur managing his own investment portfolio. He is seeking to expand his investment portfolio, which comprises solely of equities. Ross is seeking a tax-efficient investment, which has a moderate to high degree of liquidity and can bring diversification benefits to his portfolio. He is exploring direct real estate as a potential investment vehicle. Which of the following factors could *most likely* discourage Ross from investing in direct real estate?

- A. Illiquidity.
- B. Tax consequences.
- C. Low diversification potential.

Direct real estate investments are known for their illiquidity. This means that they cannot be easily bought or sold in the market without a significant change in price. This characteristic of real estate investments makes them unsuitable for Ross, who is seeking an investment with a moderate to high degree of liquidity. Ross, being a wealthy entrepreneur, would want to have the flexibility to move his investments around as per the market conditions and his financial goals. An illiquid investment like direct real estate could potentially lock up his funds for a long period of time, limiting his ability to take advantage of other investment opportunities that may arise. This could also pose a risk in case he needs to liquidate the investment in a hurry, as he may not be able to get a fair price due to the illiquid nature of the market.

B is incorrect. One of the reasons why real estate investments are popular is because of the tax benefits they offer. These benefits can come in the form of deductions for mortgage interest, property taxes, and costs associated with rental property management, among others. These tax benefits can significantly enhance the after-tax return on investment, making real estate an attractive investment option from a tax perspective. Therefore, the tax consequences of real estate investments would not discourage Ross from investing in direct real estate.

C is incorrect. Real estate as an asset class has been found to have a low correlation with traditional asset classes, such as equity and fixed-income securities. This means that the returns from real estate investments do not move in tandem with the returns from these traditional asset classes. This characteristic of real estate investments introduces diversification potential to an investor's portfolio. By investing in real estate, Ross can potentially reduce the overall risk of his portfolio and enhance its risk-adjusted return. Therefore, the low diversification potential of real estate investments would not discourage Ross from investing in direct real estate.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 4- Real Estate and Infrastructure, LOS 4b: explain the investment characteristics of real estate investments.

Q.70 At the beginning of the year 2012, Gus Knight invested \$100,000 in a hedge fund with a “1 and 10” fee structure. The fund's value at the end of the year rose to \$135,150 and by 5% by the end of 2013. Management and incentive fees were paid at the end of the year and the incentive fee is calculated net of the management fee. In the year a fund's net value declined, incentive fees would not be paid. The hedge fund's high watermark at the end of 2012 is *closest* to:

- A. \$130,418.65
- B. \$135,150.00
- C. \$139,880.00

The starting value of the fund is \$100,000 and at the end of 2012 is \$135,150 so that:

- Gross Return for 2012: $135,150 - 100,000 = 35,150$
- Management Fee = 1% of end-of-year value: $1\% \times 135,150 = 1,351.50$
- Incentive Fee = 10% of profit after management fee: Profit after management fee = $35,150 - 1,351.50 = 33,798.50$
Incentive fee = $10\% \times 33,798.50 = 3,379.85$
- Net Value After All Fees for 2012: $135,150 - 1,351.50 - 3,379.85 = 130,418.65$

The net value after fees at the end of 2012 is \$130,418.65, which represents the highest value achieved after fees. This becomes the high watermark used in 2013 for calculating fees and returns.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 2 - Alternative Investment Performance and Returns, LOS 2b: calculate and interpret alternative investment returns both before and after fees.

Q.71 Capital provided by Venture Capital (VC) funds to companies that are prepared to go public and that represents a bridge between the expanding company and the IPO is known as:

- A. Early-stage venture capital.
- B. Expansion venture capital.
- C. Mezzanine venture capital.

Mezzanine venture capital is a type of financing that is typically provided to companies that are on the verge of going public. This form of capital serves as a bridge between the company's expansion phase and its initial public offering (IPO). It is often used to finance the final stages of market expansion and operational development, preparing the company for the transition to public ownership. This is why option C is the correct answer.

A is incorrect. Early-stage venture capital is a type of financing that is provided to companies in the early stages of their development. This typically occurs when a company has moved beyond the start-up phase and is beginning to establish its operations and market presence. At this stage, the company may have a product or service that is ready for commercial production and sales, but it may not yet be profitable or have a significant market share. This type of financing is used to support the company's initial growth and development, but it does not represent a bridge to an IPO, as the company is not yet ready to go public.

B is incorrect. Expansion venture capital is a type of financing that is provided to companies that have already begun commercial production and sales and are looking to expand their operations. This could be used for the initial expansion of a company that is already producing and selling a product, or for major expansions of a company that is looking to increase its market share or enter new markets. However, like early-stage venture capital, expansion venture capital does not represent a bridge to an IPO. While it may be used in the stages leading up to an IPO, it is not specifically designed to prepare a company to go public.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 3- Investments in Private Capital: Equity and Debt, LOS 3a: explain features of private equity and its investment characteristics.

Q.72 Which of the following will *most likely* decrease the value of a European put option?

- A. Lower carrying costs than previously observed in the market.
- B. Higher volatility than previously observed in the market.
- C. Higher risk-free interest rates than previously observed in the market.

Higher risk-free interest rates than previously observed in the market will most likely decrease the value of a European put option. The reasoning behind this is that a higher risk-free interest rate will lower the present value of the receipt to the exercise price upon exercise. This is because the risk-free interest rate is used to discount the future cash flows to their present value. If the risk-free interest rate increases, the present value of the future cash flows decreases. In the case of a European put option, the future cash flow is the exercise price that the holder of the option will receive upon exercise. Therefore, if the present value of this receipt decreases, the value of the European put option also decreases.

A is incorrect. Lower carrying costs will lower the effective cost of holding the asset, which in turn increases the value of a European put option. Carrying costs include all costs associated with holding or storing an asset over a period of time. If these costs decrease, it becomes cheaper to hold the asset, which makes the put option more valuable because it gives the holder the right to sell the asset at a predetermined price.

B is incorrect. Higher volatility actually increases the value of a European put option. This is because volatility is a measure of the uncertainty or risk about the size of changes in a security's value. A higher volatility means that the price of the underlying asset can change dramatically over a short time period in either direction. In the case of a put option, which gives the holder the right to sell the asset at a predetermined price, higher volatility increases the chances of the underlying price declining relative to the exercise price, making the put option more valuable.

CFA Level 1, Topic 8 - Derivatives, Learning Module 8- Pricing and Valuation of Options, LOS 8c: Identify the factors that determine the value of an option and describe how each factor affects the value of an option.

Q.73 Leslie Hower is a junior trader at a derivatives dealer firm. During her first week following appointment, Hower attempts to sell a risk-free bond using call and put options synthetically. She purchases call and put options with the same exercise price and time to maturity. She simultaneously buys the underlying. With respect to her attempts in creating a synthetic short position in a risk-free bond, she is *most* accurate regarding her decision to:

- A. Buy the underlying.
- B. Purchase call options.
- C. Purchase put options.

Option B is the most accurate decision Leslie Hower could make in her attempt to create a

synthetic short position in a risk-free bond. This is because, according to the rearranged put-call parity, a synthetic short risk-free bond can be created by purchasing call options and simultaneously short selling the underlying and put options.

The put-call parity is a fundamental concept in options pricing which states that the price of a call option implies a certain fair price for the corresponding put option having the same strike price and expiration date, and vice versa. It is used to check the price of options, as any deviations from the put-call parity equation would provide arbitrage opportunities.

The rearranged put-call parity equation for a synthetic risk-free bond is as follows:

$$\text{Synthetic risk-free bond} = P_0 + S_0 - c_0 = \frac{x}{(1+r)^T}$$

And for a synthetic short risk-free bond, the equation is:

$$\text{Synthetic short risk-free bond} = -P_0 - S_0 + c_0 = -\frac{x}{(1+r)^T}$$

Where P_0 is the price of the put option, S_0 is the price of the underlying, c_0 is the price of the call option, x is the strike price, r is the risk-free rate, and T is the time to maturity.

A is incorrect. Buying the underlying is not the correct decision in this case. According to the rearranged put-call parity, to create a synthetic short risk-free bond, the underlying should be sold short, not bought. Buying the underlying would create a long position, not a short position. This would increase the risk exposure instead of hedging it, which is not the desired outcome in this scenario.

C is incorrect. Purchasing put options is also not the correct decision. According to the rearranged put-call parity, to create a synthetic short risk-free bond, put options should be sold short, not bought. Buying put options would create a long position in put options, which is not the desired outcome in this scenario. The goal is to create a short position in a risk-free bond, and this can be achieved by short selling put options, not by buying them.

CFA Level 1, Topic 8 - Derivatives, Learning Module 9- Option Replication Using Put-Call Parity, LOS 9a: explain put-call parity for European options.

Q.74 In contrast to interest rate options, forward rate agreements (FRAs):

- A. impose obligations on the counterparties.
- B. are contracts with an interest rate as the underlying.
- C. are offered for purchase and sale by different dealers.

Forward Rate Agreements (FRAs) indeed impose obligations on the counterparties. FRAs are essentially contracts between two parties that determine the interest rate to be paid on an agreed upon date in the future. This agreement is binding and obligates both parties to adhere to the terms of the contract. The buyer of the FRA is obligated to pay the agreed upon interest rate to the seller, while the seller is obligated to pay the prevailing market rate to the buyer. This exchange of payments is mandatory, regardless of the prevailing market conditions at the time of the contract's execution. This characteristic of FRAs distinguishes them from interest rate options, which give the holder the right, but not the obligation, to buy or sell an underlying asset at a specified price before the contract expires.

B is incorrect. The statement that FRAs are contracts with an interest rate as the underlying is not a distinguishing feature between FRAs and interest rate options. Both financial instruments use interest rates as their underlying asset. An interest rate option is a financial derivative that gives the holder the right, but not the obligation, to obtain a loan or deposit at a certain interest rate. Similarly, a Forward Rate Agreement is a contract between two parties that determines the interest rate to be paid on an agreed upon date in the future. Therefore, the underlying asset in both cases is the interest rate.

C is incorrect. Both FRAs and interest rate options are typically offered by the same financial institutions or dealers. These could include commercial banks, investment banks, or other financial services companies. These institutions act as intermediaries, facilitating the buying and selling of these financial instruments between different parties. Therefore, the claim that FRAs and interest rate options are offered by different dealers is not accurate.

CFA Level 1, Topic 8 - Derivatives, Topic 8, Learning Module 2- Forward Commitment and Contingent Claim Features and Instruments, LOS 2c: contrast forward commitments with contingent claims.

Q.75 A key risk cited for investing in alternative investments includes:

- A. limited redemption availability.
- B. concentrated portfolio positions.
- C. reduced diversification potential.

A key risk for investing in alternative investments includes limited redemption availability. This is because alternative investments often have restrictions on when and how much of the investment can be redeemed or sold. This is a significant risk because it can limit an investor's ability to access their funds when they need them. For example, if an investor needs to liquidate their investment to cover an unexpected expense, they may not be able to do so due to these restrictions. This lack of liquidity can also make it more difficult for an investor to manage their portfolio effectively, as they may not be able to rebalance their investments as needed. Furthermore, these restrictions can also increase the risk of loss if the value of the investment declines and the investor is unable to sell their investment to prevent further losses.

B is incorrect. Concentrated portfolio positions can indeed pose a risk, but they are not specific to alternative investments. A concentrated portfolio position refers to a situation where a significant portion of a portfolio is invested in a single or small number of investments. This can increase the risk of loss if the value of these investments declines. However, this risk is not unique to alternative investments and can occur with any type of investment if the portfolio is not diversified properly.

C is incorrect. Reduced diversification potential is not a key risk of alternative investments. In fact, one of the main benefits of alternative investments is their potential to increase portfolio diversification. Because alternative investments often have a low correlation with traditional asset classes, they can help to reduce portfolio risk by providing a source of returns that is not closely tied to the performance of traditional investments. Therefore, while it is true that some alternative investments may have a limited diversification potential due to their unique characteristics, this is not a key risk of alternative investments as a whole.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 1- Alternative Investment Features, Methods, and Structures, LOS 1a: describe features and categories of alternative investments.

Q.76 A drawback of investing in funds of hedge funds *most likely* includes:

- A. diluted returns.
- B. longer lockup periods.
- C. difficulty in conducting due diligence.

A drawback of investing in funds of hedge funds most likely includes diluted returns. This is due to the multi-layered fee structure associated with hedge funds. The fees are charged at multiple levels, including management fees and performance fees. The management fees are typically a percentage of the total assets under management, while the performance fees are a percentage of the profits earned. This multi-layered fee structure can significantly reduce the net-of-fee returns for the investors, leading to diluted returns. This is a significant drawback as it reduces the overall profitability of the investment for the investors. Therefore, it is crucial for investors to consider the impact of these fees on their potential returns before investing in funds of hedge funds.

B is incorrect. It suggests that a drawback of investing in funds of hedge funds is longer lockup periods. However, this is not typically the case. In fact, one of the benefits of investing in funds of hedge funds is that they often have shorter lockup periods compared to individual hedge funds. Lockup periods refer to the period of time during which investors are not allowed to withdraw their funds. Shorter lockup periods provide investors with greater liquidity and flexibility, which is a significant advantage.

C is incorrect. It suggests that a drawback of investing in funds of hedge funds is difficulty in conducting due diligence. However, this is not typically the case. In fact, funds of hedge funds often provide expertise in and conduct due diligence in selecting individual hedge funds. This can be a significant advantage for investors, as it can help them to identify high-quality hedge funds and reduce their risk.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 6 -Hedge Funds, LOS 6a: explain the investment features of hedge funds and contrast them with other asset classes.

Q.77 Garcia Miguel is comparing the valuation of three private equity companies for investment using the discounted cash flow approach. She has collected cash flow data for the three companies (Exhibit) and would like to invest in the one with the highest valuation.

Company	Free Cash Flows to Equity	Cost of equity
A	\$40,000	5%
B	\$155,000	12%
C	\$88,100	6%

All cash flow forecasts are perpetual. Miguel should *most likely* invest in Company

- A. A
- B. B
- C. C

When comparing the valuation of three private equity companies for investment using the discounted cash flow approach, it is important to consider both the free cash flows to equity and the cost of equity. The company with the highest valuation is the one that provides the highest return on investment, taking into account both the cash flows and the cost of equity. In this case, Company C has the highest valuation.

For Company A, the valuation is calculated by dividing the free cash flows to equity (\$40,000) by the cost of equity (5%). This gives us a valuation of \$800,000. While this is a substantial amount, it is not the highest valuation of the three companies.

For Company B, the valuation is calculated by dividing the free cash flows to equity (\$155,000) by the cost of equity (12%). This gives us a valuation of \$1,291,667. While this is higher than the valuation of Company A, it is still not the highest valuation of the three companies.

For Company C, the valuation is calculated by dividing the free cash flows to equity (\$88,100) by the cost of equity (6%). This gives us a valuation of \$1,468,333, which is the highest valuation of the three companies.

Company C offers a balance between free cash flows to equity and cost of equity, resulting in the highest valuation. While its free cash flows to equity are not the highest, they are substantial, and when combined with a relatively low cost of equity, they result in the highest valuation. This makes Company C the most attractive investment option among the three companies.

CFA Level 1, Topic 8 - Alternative Investments, Learning Module 3- Investments in Private Capital: Equity and Debt, LOS 3a: explain features of private equity and its investment characteristics.

Q.78 An analyst is calculating the one-year price of a commodity future contract with the following characteristics:

Spot price	\$80.96
Convenience yield at the end of one year	\$5.50
Storage costs at the end of one year	\$7.80

If the risk-free rate is 5%, then the future price of a one-year commodity future contract is *closest* to:

- A. \$87.31
- B. \$83.42
- C. \$82.71

The future price of a commodity can be calculated using the formula: Future Price = Spot Price * (1 + Risk-free rate) + Storage Cost - Convenience Yield. In this case, the Spot Price is \$80.96, the Risk-free rate is 5%, the Storage Cost is \$7.80, and the Convenience Yield is \$5.50. Substituting these values into the formula gives us: Future Price = \$80.96 * (1 + 5%) + \$7.80 - \$5.50 = \$87.31. This calculation shows that the future price of the commodity, given these specific conditions, is closest to \$87.31.

B is incorrect. The value given in Option B, \$83.42, does not match the result of the calculation. This suggests that this option may have been derived using incorrect values or an incorrect formula. For example, if the Convenience Yield was not subtracted from the sum of the Spot Price (adjusted for the Risk-free rate) and the Storage Cost, the result would be higher than the correct future price.

C is incorrect. The value given in Option C, \$82.71, is also not a match for the result of the calculation. This suggests that this option may have been derived using incorrect values or an incorrect formula. For example, if the Storage Cost was not added to the Spot Price (adjusted for the Risk-free rate), the result would be lower than the correct future price.

CFA Level 1, Topic 8 - Derivatives, Topic 8, Learning Module 6- Pricing and Valuation of Futures Contracts, LOS 6b: explain why forward and futures prices differ.

Q.79 Mark Taylor is an equity investor who has recently purchased the stock of a Kenyan enterprise. The risk-free rate of return in Kenya is 4.5%, while the expected return on the market index is 7.2%. The correlation of the stocks purchased with the market index has recently increased from 0.6 to 0.8, and the standard deviation of the stock and market index is 25.7% and 16.4% respectively. The expected return on the Kenyan stock is *closest* to:

- A. 5.88%
- B. 7.88%

C. 11.70%

The Capital Asset Pricing Model (CAPM) is a model used to determine a theoretically appropriate required rate of return of an asset. The formula for CAPM is:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

Where:

$E(R_i)$ – Expected return of the investment.

R_f – Risk-free rate.

β_i – Beta of the investment.

$E(R_m)$ – Expected return of market.

In this case, the beta of the asset is calculated using the formula:

$$\beta_i = \frac{\rho_{i,m}\sigma_i}{\sigma_m}$$

Where:

β_i – Beta coefficient of the asset.

$\rho_{i,m}$ – Correlation coefficient between the returns of the asset R_i and returns of the market R_m .

σ_i – Standard deviation (volatility) of the returns of the asset.

σ_m – Standard deviation (volatility) of the returns of the market.

Substituting the given values into the formula, we get:

$$\beta_i = \frac{0.8 \times 0.257}{0.164} = 1.2537$$

Substituting this value of beta into the CAPM formula, we get:

$$E(R_i) = 4.5\% + 1.2537(7.2\% - 4.5\%) = 7.88\%$$

A is incorrect. This option incorrectly calculates the beta as:

$$\beta_i = \frac{0.8 \times 0.164}{0.164} = 0.8$$

And then uses this incorrect beta value in the CAPM formula to get:

$$E(R_j) = 4.5\% + 0.8(7.2\% - 4.5\%) = 5.88\%$$

This is incorrect because the beta value is calculated incorrectly, leading to an incorrect expected return.

C is incorrect. This option incorrectly assumes that the expected return is simply the sum of the risk-free rate and the expected return of the market, which is not the case. The expected return is calculated using the CAPM formula, which takes into account the risk-free rate, the beta of the investment, and the expected return of the market. Simply adding the risk-free rate and the expected return of the market does not give the correct expected return.

CFA Level 1, Topic 9 - Portfolio Management, Learning Module 1- Portfolio Risk and Return: Part I, LOS 1d: calculate and interpret the mean, variance, and covariance (or correlation) of asset returns based on historical data.

Q.80 Maya Thomas is an independent equity investor who has undertaken investment in a Brazilian coffee manufacturer's stock. The covariance of the manufacturer's stock with the market index is 0.01577, and the market variance is 0.01360. Thomas can *most likely* anticipate earning a return on her equity investment that is:

- A. less than the risk-free rate.
- B. less than the market return.
- C. greater than the market return.

The Beta of the stock, which is calculated by dividing the covariance of the stock with the market index by the market variance, is 1.1596 ($0.01577/0.01360$). Beta is a measure of the systematic risk of a security or a portfolio in comparison to the market as a whole. A beta greater than 1.00 implies that the stock is more volatile than the market, and therefore, the expected return on the stock is higher than the market return. This is because investors require a higher return for taking on more risk. A positive beta also indicates that the required return will be greater than the risk-free rate. The risk-free rate is the theoretical rate of return of an investment with zero risk, typically the interest rate on a 3-month government treasury bill. Since the stock has a beta greater than 1, it is expected to yield a return greater than both the market return and the risk-free rate.

A is incorrect. This option suggests that the return on the equity investment would be less than the risk-free rate. However, as explained above, a positive beta indicates that the required return will be greater than the risk-free rate. Therefore, this option is not correct.

B is incorrect. This option suggests that the return on the equity investment would be less than the market return. However, a beta greater than 1.00 implies that the expected return on the stock is higher than the market return. Therefore, this option is not correct.

CFA Level 1, Topic 9 - Portfolio Management, Learning Module 2 - Portfolio Risk and Return: Part II, LOS 2g: calculate and interpret the expected return of an asset using the CAPM.

Q.81 Doug Smith, a portfolio manager, created the following portfolio:

Security	Expected Return (%)	Expected Standard Deviation(%)
A	18	12
B	15	10

If the portfolio of the two securities has an expected return of 16%, the proportion invested in Security A is *closest to*:

- A. 33%
- B. 67%.
- C. 133%.

To solve this question, we can use the formula for the expected return of a portfolio. The expected return of a portfolio is the weighted average of the expected returns of the individual securities in the portfolio. Let W_A represent the weight of Security A in the portfolio, and $W_B = 1 - W_A$ represent the weight of Security B (since the total weight must sum up to 1).

The formula for the expected return of the portfolio is given by:

$$16\% = W_A \times 18\% + (1 - W_A) \times 15\%$$

We can solve for W_A as follows:

$$\begin{aligned}16\% &= W_A \times 18\% + (1 - W_A) \times 15\% \\16\% &= 18\% \times W_A + 15\% - 15\% \times W_A \\16\% &= 3\% \times W_A + 15\% \\1\% &= 3\% \times W_A \\W_A &= \frac{1\%}{3\%} \\W_A &= \frac{1}{3} \text{ or approximately } 33\%\end{aligned}$$

B is incorrect. A calculation suggesting 67% investment in Security A would imply a higher expected return than 16%, given that Security A has a higher expected return (18%) than Security B (15%). The weight of Security A in the portfolio is calculated based on the desired portfolio return, which in this case is closer to the return of Security B, indicating a lower weight in Security A.

C is incorrect. A proportion of 133% suggests leveraging or borrowing to invest more than the total portfolio value in Security A, which is not implied by the given information. The question asks for the proportion of the portfolio invested in Security A to achieve a specific expected return, not leveraging strategies. Moreover, a proportion greater than 100% is not feasible in the

context of this question, which deals with the allocation between two securities within a portfolio without considering borrowing or leveraging.

CFA Level 1, Topic 9, Portfolio Management, Learning Module 1: Portfolio Risk and Return: Part I, LOS (c) Explain the selection of an optimal portfolio, given an investor's utility (or risk aversion) and the capital allocation line.

Q.82 Which section of the investment policy statement describes the custodian of the client's assets?

- A. Introduction.
- B. Investment guidelines.
- C. Statement of duties and responsibilities.

The duties and responsibilities of the investment policy statement is crucial as it outlines the roles and responsibilities of all parties involved in the investment process. This includes the client, the custodian of the client's assets, and the investment managers. The custodian's role is particularly important as they are responsible for the safekeeping of the client's assets. They ensure that the assets are properly accounted for and that transactions are executed correctly. This section provides a clear understanding of who is responsible for what, thereby reducing the potential for misunderstandings or disputes.

A is incorrect. The introduction section of the investment policy statement does not describe the custodian of the client's assets. Instead, it provides a general overview of the policy, including its purpose and objectives. It may also include information about the client, such as their investment goals, risk tolerance, and time horizon. However, it does not delve into the specific duties and responsibilities of the custodian or other parties involved in the investment process.

B is incorrect. The investment guidelines section of the investment policy statement also does not describe the custodian of the client's assets. This section provides detailed information about how the investment policy should be executed. It may include guidelines on the permissible use of leverage and derivatives, as well as any specific types of assets that are excluded from investment. While this section is important for guiding the investment process, it does not outline the roles and responsibilities of the custodian or other parties.

CFA Level 1, Topic 9 - Portfolio Management, Learning Module 2 - Basic of Portfolio Planning and Construction, LOS 2b: describe the major components of an IPS.

Q.83 Invest Capital's risk manager is considering a 3-month call option strategy on a company's share. The share price of the company today is USD 80 per share. The call option on the company's shares is \$2.5, with an exercise price is \$88.40 per share. If, at maturity, the company's share price is \$95, the profit per share of this strategy is *closest to the*:

- A. \$2.50.
- B. \$4.10.
- C. \$6.60.

The profit of a call option is calculated by subtracting the initial cost of the call option (premium) from the maximum of zero and the difference between the share price at maturity and the exercise price. In this case, the share price at maturity is \$95, the exercise price is \$88.40, and the premium is \$2.5. Therefore, the profit is calculated as follows:

$$\begin{aligned}\Pi &= \max(0, S_T - X) - c_0 \\&= \max(0, 95 - 88.40) - 2.5 \\&= \max((0, 6.6)) - 2.5 \\&= \$6.60 - \$2.5 = \$4.10\end{aligned}$$

A is incorrect. This option suggests that the profit per share of this strategy is \$2.50, which is the premium of the call option. However, the premium is the cost of the option and not the profit. The profit is calculated by subtracting the premium from the payoff of the option, which is the maximum of zero and the difference between the share price at maturity and the exercise price. Therefore, option A is incorrect because it confuses the premium with the profit.

C is incorrect. This option suggests that the profit per share of this strategy is \$6.60. However, this is the payoff of the call option, not the profit. The payoff of a call option is the maximum of zero and the difference between the share price at maturity and the exercise price. The profit is calculated by subtracting the premium from the payoff. Therefore, option C is incorrect because it confuses the payoff with the profit.

CFA Level I, Topic 9, Derivatives, Learning Module 2: Forward Commitment and Contingent Claim Features and Instruments. LOS (b): Determine the value at expiration and profit from a long or a short position in a call or put option.

Q.84 Malala Pham is an equity analyst. Her supervisor has given her the task of deriving the beta of a stock from the CAPM. What is the value of the beta if the risk-free rate is 3%, the expected return of the market is 14%, and the return on the stock is 11.8%?

- A. 1
- B. 1.5
- C. 0.8

The beta of a stock is a measure of its systematic risk or market risk, which cannot be eliminated through diversification. It is used in the Capital Asset Pricing Model (CAPM) to calculate the expected return of a stock. The formula for the expected return on a stock according to the CAPM is: Expected return on stock = Risk-free rate + beta * (Market return - Risk-free rate). In this case, the expected return on the stock is given as 11.8%, the risk-free rate is 3%, and the expected return of the market is 14%. We can substitute these values into the CAPM formula and solve for beta.

So, $11.8\% = 3\% + \text{beta} * (14\% - 3\%)$. Simplifying the equation, we get $11.8\% - 3\% = \text{beta} * 11\%$. This simplifies to $8.8\% = \text{beta} * 11\%$. Solving for beta, we get $\text{beta} = 0.8$. This means that the stock is less volatile than the market, as a beta of less than 1 indicates that the security will be less volatile than the market. Therefore, the beta of the stock is 0.8.

A is incorrect. A beta of 1 would imply that the stock's price would move with the market. In other words, this stock would be just as risky as the market. However, given the information provided in the question, we can see that the stock's return of 11.8% is less than the market return of 14%. This indicates that the stock is less risky than the market, which contradicts the assumption of a beta of 1.

B is incorrect. A beta of 1.5 would suggest that the stock is 50% more volatile than the market. This means that if the market's return increased by 10%, the stock's return would increase by 15%. However, the stock's return of 11.8% is less than the market return of 14%, indicating that the stock is less volatile than the market. Therefore, a beta of 1.5 does not accurately represent the stock's risk profile.

CFA Level 1, Topic 9 - Portfolio Management, Learning Module - Portfolio Risk and Return: Part II, LOS g: calculate and interpret the expected return of an asset using the CAPM.

Q.85 Kate Williams is a portfolio risk analyst for Hampton Funds. She is assigned to calculate the beta of Lion Inc. shares. What is its beta if the standard deviation of market returns is 19% and the covariance of Lions returns with the market return is 0.163?

- A. 0.85
- B. 4.51
- C. 0.0451

Beta is a measure of the systematic risk of a security or a portfolio in comparison to the market as a whole. It is used in the capital asset pricing model (CAPM), which calculates the expected return of an asset based on its beta and expected market returns. The formula to calculate beta is the covariance of the asset's return with the market return divided by the variance of the market returns.

In this case, the covariance of Lion Inc.'s returns with the market return is given as 0.163. The standard deviation of the market returns is given as 19%, which needs to be squared to get the variance ($0.19^2 = 0.0361$). Therefore, by substituting these values into the formula, we get Beta = $0.163/0.0361 = 4.51$.

A is incorrect. A beta of 0.85 would imply that Lion Inc.'s returns move in the same direction as the market's returns but are less volatile. This is not the case here as the calculated beta is significantly higher than 0.85, indicating that Lion Inc.'s returns are more volatile and have a stronger relationship with the market's returns.

C is incorrect. A beta of 0.0451 would suggest that Lion Inc.'s returns are significantly less volatile than the market's returns and have a very weak relationship with the market's returns. This is not the case here as the calculated beta is significantly higher than 0.0451, indicating that Lion Inc.'s returns are more volatile and have a stronger relationship with the market's returns.

CFA Level 1, Topic 9 - Portfolio Management, Topic 9, Learning module 2 - Portfolio Risk and Return: Part II, LOS 2e: calculate and interpret beta.

Q.86 The feedback step *least likely* assists in rebalancing the client's portfolio due to change in:

- A. Security prices.
- B. Asset weightings
- C. Circumstances of the investment manager.

The feedback step in portfolio management is a crucial process that aids in adjusting the client's portfolio based on changes in market conditions or the client's circumstances. The correct answer is option C, which states that the feedback step least likely assists in rebalancing the client's portfolio due to changes in the circumstances of the investment manager. This is because the feedback step is primarily focused on the client's portfolio and not the investment manager's circumstances. The investment manager's circumstances do not directly impact the client's portfolio and hence, are not a significant factor in the feedback step of portfolio rebalancing.

A is incorrect. Security prices are a critical factor in portfolio management. Changes in security prices can significantly impact the value of the client's portfolio. Therefore, the feedback step does assist in rebalancing the client's portfolio when there are changes in security prices. The feedback step allows the portfolio manager to adjust the portfolio based on these changes to ensure that the portfolio remains aligned with the client's investment objectives.

B is incorrect. Asset weightings refer to the proportion of each asset in the client's portfolio. Changes in asset weightings can occur due to changes in the value of the assets in the portfolio. The feedback step assists in rebalancing the client's portfolio when there are changes in asset weightings. This is done to ensure that the portfolio remains balanced and continues to meet the client's investment objectives.

CFA Level 1, Topic 9 - Portfolio Management, Topic 9, Learning Module 4 - Introduction to Risk Management, LOS 4b: describe features of a risk management framework.

Q.87 At the beginning of the year 2010, an investor deposited \$25,000 in his investment account. He generated an investment gain of \$4,000 during the same year, which resulted in an ending account balance of \$29,000. In 2011, the investor withdrew \$12,000 from his account at year-end. At the end of the year 2012, the investor deposited a further \$5,000. In 2013, no further transactions were made, and the value of the investment account at the end of the year was \$20,000. The IRR of the investment account is *closest* to:

- A. 1.88%
- B. 3.44%
- C. 20.11%

The Internal Rate of Return (IRR) is a financial metric that is widely used in capital budgeting and investment planning. It represents the discount rate that makes the net present value (NPV) of all cash flows (both positive and negative) from a particular project equal to zero. In this case, the IRR is calculated by entering the following amounts into the financial calculator:

$$CF_0 = -25,000$$

$$CF_1 = 12,000$$

$$CF_2 = -5,000$$

$$CF_3 = 20,000$$

After entering these values, the IRR is calculated to be 3.44%. This means that the investor's rate of return on his investment is 3.44% per year, which is the rate that equates the present value of the cash inflows to the present value of the cash outflows. This is the rate at which the investor is indifferent between receiving the cash flows from the investment or receiving the same amount of money today.

A is incorrect. An IRR of 1.88% would mean that the investor's rate of return on his investment is lower than the actual rate. This would imply that the present value of the cash inflows is less than the present value of the cash outflows, which is not the case in this scenario. The investor's actual rate of return is higher, as evidenced by the positive net present value of the investment.

C is incorrect. An IRR of 20.11% would mean that the investor's rate of return on his investment is significantly higher than the actual rate. This would imply that the present value of the cash inflows is much greater than the present value of the cash outflows, which is not the case in this scenario. The investor's actual rate of return is lower, as evidenced by the positive but smaller net present value of the investment.

CFA Level 1, Topic 9 - Portfolio Management, Learning Module 2- Portfolio Risk and Return: Part II, LOS 2a: describe the implications of combining a risk-free asset with a portfolio of risky assets.

Q.88 Which of the following is *not* a true statement about VaR?

- A. A VaR measure does not tell the maximum loss.
- B. A VaR measure focuses on the right tail of the distribution.
- C. VaR is subject to the same model risk as to the derivative pricing model.

VaR is a statistical technique used to measure and quantify the level of financial risk within a firm or investment portfolio over a specific time frame. This measure is most commonly used by investment and commercial banks to determine the extent and occurrence ratio of potential losses in their institutional portfolios. VaR metrics generally focus on the left tail of the distribution of returns, which represents the worst losses. Therefore, focusing on the right tail, which represents the best gains, would not provide the necessary risk assessment. This is why option B is incorrect.

A is incorrect. VaR provides a measure of risk in terms of the maximum loss that can be expected with a certain degree of confidence over a certain period of time. However, it does not provide the absolute maximum loss. The VaR measure is based on historical data and statistical models, and it assumes that the future will behave like the past. Therefore, it cannot predict extreme events that have not occurred in the past. This is why option A is incorrect.

C is incorrect. Model risk is the risk of loss resulting from using insufficiently accurate models to make decisions. Both VaR and derivative pricing models are based on assumptions and statistical estimations, and therefore, they are both subject to model risk. If the assumptions or estimations are incorrect, the models can provide inaccurate predictions, leading to potential losses. This is why option C is incorrect.

CFA Level 1, Topic 9 - Portfolio Management, Learning Module 1 - Portfolio Risk and Return: Part I, LOS 1g: describe and interpret the minimum-variance and efficient frontiers of risky assets and the global minimum-variance portfolio.

Q.89 Sasha Gable manages the portfolio of a pension fund, which is equally invested in equities and real estate. The correlation between the two securities is 0.10. Details concerning expected annual returns and standard deviations are summarized in the exhibit below:

	Expected Annual Return (%)	Expected Annual Standard Deviation (%)
Equities	15.5	5.7
Real estate	22.1	13.8

Holding all else constant, if Gable decides to increase the weight of equities to 60% by selling real estate, the portfolio standard deviation will, in percentage terms:

- A. Increase by 3.38%.

B. Decrease by 12.18%.

C. Decrease by 14.44%

The correct answer is option B, which suggests that the portfolio standard deviation will decrease by 12.18% if Gable decides to increase the weight of equities to 60% by selling real estate. This is determined by calculating the standard deviation of the current portfolio and the new portfolio, and then comparing the two.

The standard deviation of the current portfolio is calculated using the formula for the standard deviation of a two-asset portfolio, which is:

$$\sigma_{\text{port}} = \sqrt{(w_1)^2(\sigma_1)^2 + (w_2)^2(\sigma_2)^2 + 2 \times (w_1)(w_2)(\rho)(\sigma_1)(\sigma_2)}$$

where w_1 and w_2 are the weights of the two assets, σ_1 and σ_2 are the standard deviations of the two assets, and ρ is the correlation between the two assets. Substituting the given values into the formula, we get:

$$\sigma_{\text{port}} = \sqrt{(0.5)^2(0.057)^2 + (0.5)^2(0.138)^2 + 2 \times (0.5)(0.5)(0.10)(0.057)(0.138)} = 0.0772$$

This means that the standard deviation of the current portfolio is 7.596%.

Next, we calculate the standard deviation of the new portfolio, where the weight of equities is increased to 60%. Using the same formula, we get:

$$\sigma_{\text{port,new}} = \sqrt{(0.6)^2(0.057)^2 + (0.4)^2(0.138)^2 + 2 \times (0.6)(0.4)(0.10)(0.057)(0.138)} = 0.0678$$

This means that the standard deviation of the new portfolio is 6.6374%.

Finally, we compare the standard deviation of the new portfolio to that of the current portfolio. The percentage change in standard deviation is given by $[(0.0678/0.0772) - 1]$, which equals -12.18%. This means that the standard deviation of the portfolio will decrease by 12.18% if Gable increases the weight of equities to 60% by selling real estate.

CFA Level 1, Topic 9 - Portfolio Management, Topic 1, Learning Module 1 - Portfolio Risk and Return: Part I, LOS 1e: calculate and interpret portfolio standard deviation.

Q.90 Stock returns are usually negatively skewed. This statement implies that:

- A. The standard deviation will be underestimated.
- B. There is a lower probability of extreme returns.
- C. There is a lower frequency of positive deviations from the mean.

In the context of stock returns, negative skewness implies that the distribution of returns is not symmetrical, but skewed to the left. This means that there are fewer values to the left of (less than) the mean, but these values are farther from the mean than the values to the right of the mean. This asymmetry has the effect of underestimating the standard deviation, which is a measure of the dispersion of a set of data from its mean. The standard deviation is underestimated because it does not fully capture the extent of the extreme values on the left side of the distribution. Therefore, the statement that stock returns are usually negatively skewed implies that the standard deviation will be underestimated.

B is incorrect. The statement that there is a lower probability of extreme returns is not implied by the negative skewness of stock returns. The probability of extreme returns is more accurately described by the concept of kurtosis, which refers to the "fatness" of the tails of a distribution. A distribution with high kurtosis has fatter tails, which means there is a higher than normal probability of extreme returns. This concept is not captured in a mean-variance framework, which only considers the first two moments (mean and variance) of a distribution. Therefore, negative skewness does not imply a lower probability of extreme returns.

C is incorrect. The statement that there is a lower frequency of positive deviations from the mean is not implied by the negative skewness of stock returns. Negative skewness refers to the asymmetry of the distribution, not the frequency of positive or negative deviations from the mean. A negatively skewed distribution can still have a high frequency of positive deviations from the mean, as long as these deviations are not as extreme as the negative deviations. Therefore, negative skewness does not imply a lower frequency of positive deviations from the mean.

CFA Level 1, Topic 9 - Portfolio Management, Learning Module 2- Portfolio Risk and Return: Part II, LOS 2c: explain systematic and non-systematic risk, including why an investor should not expect an additional return for bearing non-systematic risk.
