Level I of the CFA® Exam

Mock Questions with Answers - Mock Exam 2025 #2 - Second Session (Corporate Finance, Equity, Fixed Income, Derivatives, Alternative Investments & Portfolio Management)

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Q.1 A degree of operating leverage (DOL) ratio of 3.34 suggests that a 10% increase in sales will result in a:

     A. 33.4% increase in net income.

     B. 33.4% increase in operating income.

     C. 33.4% decrease in operating income.

The degree of operating leverage (DOL) is a financial ratio that measures the sensitivity of a company's operating income to changes in its sales volume. It is calculated by dividing the percentage change in operating income by the percentage change in units sold. The formula for DOL is as follows:

$$\text{DOL} = \frac{\text{Percentage change in operating income}}{\text{Percentage change in units sold}}$$

In this case, a DOL ratio of 3.34 indicates that for every 10% increase in sales, there will be a 33.4% increase in operating income. This is calculated by multiplying the DOL ratio by the percentage increase in sales:

$$3.34 = \frac{\text{x}}{10\%} \Rightarrow \text{x} = 3.34 \times 10\% = 33.4\%$$

This means that the company's operating income is highly sensitive to changes in sales volume. A small increase in sales can lead to a significant increase in operating income, which can greatly enhance the company's profitability.

Option A is incorrect. This option suggests that a 10% increase in sales will result in a 33.4% increase in net income. However, the DOL ratio measures the impact on operating income, not net income. Operating income is a measure of a company's profitability before interest and taxes, while net income is the profit after all expenses, including interest and taxes, have been deducted. Therefore, a 10% increase in sales will not necessarily lead to a 33.4% increase in net income, as this will depend on other factors such as the company's interest expenses and tax rate.

Option C is incorrect. This option suggests that a 10% increase in sales will result in a 33.4% decrease in operating income. However, the DOL ratio measures the sensitivity of operating income to changes in sales volume. A higher DOL ratio indicates that operating income will increase at a faster rate than sales. Therefore, a 10% increase in sales will not lead to a decrease in operating income, but rather an increase. The higher the DOL ratio, the greater the increase in operating income for a given increase in sales.

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

Q.2 Takeover defenses are provisions that are used to make a firm less attractive. Which party is *most likely* deterred by such a move?

  A. Regulators.

  B. Shareholders.

  C. Hostile bidders.

Hostile bidders are individuals or entities that aim to acquire a company without the consent of its management and board of directors. The primary purpose of takeover defenses is to deter these hostile bidders. This is achieved by making the process of takeover more difficult, expensive, or less appealing. Various strategies are employed as takeover defenses, including poison pills, staggered boards, and golden parachutes. A poison pill strategy, for instance, allows existing shareholders to purchase more shares at a discount if a certain percentage of the company's shares are acquired by a hostile bidder, making the takeover prohibitively expensive. Staggered boards involve having a board of directors where only a fraction of the members are up for election at a time, making it harder for a hostile bidder to gain control of the board. Golden parachutes offer lucrative benefits to top executives in the event of a takeover, making the acquisition more costly for the hostile bidder.

A is incorrect. Regulators are not deterred by takeover defenses. Regulators are bodies that enforce laws and regulations within various industries to ensure fairness, compliance, and protection of public interests. Takeover defenses are not designed to deter regulators. These strategies are internal measures used by companies to fend off unwanted takeover attempts. While regulators may scrutinize the legality and compliance of these defenses within the framework of securities and corporate law, they are not the intended targets of such strategies. Therefore, the assertion that regulators are most likely deterred by takeover defenses is incorrect.

B is incorrect. Shareholders are not the primary targets of takeover defenses. Shareholders, as the owners of a company through their stock holdings, are not the ones that takeover defenses aim to deter. While some shareholders may perceive takeover defenses as a means to safeguard their investment from undervalued acquisition offers, others may criticize these measures. The criticism often stems from the belief that these defenses can entrench management and prevent shareholders from receiving a premium on their shares in a takeover scenario. Therefore, the assertion that shareholders are most likely deterred by takeover defenses is incorrect.

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

Q.3 The expected P/E ratio of a stock is 10, and the actual P/E ratio is 10.8. What can we say about the stock?

      A. The stock is overvalued.

      B. The stock is undervalued.

      C. The stock is correctly valued.

The actual Price-to-Earnings (P/E) ratio of the stock is higher than its expected P/E ratio. The P/E ratio is a key metric used in the financial world to evaluate the valuation of a stock relative to its earnings. When the actual P/E ratio is higher than the expected P/E ratio, it indicates that the stock is trading at a price higher than what its earnings can justify. This suggests that the stock is overvalued.

Investors often use the P/E ratio to gauge the relative value of a company's shares. A high P/E ratio could indicate that the market has high expectations for a company's future earnings growth. However, when the actual P/E ratio exceeds the expected P/E ratio, it implies that the stock's price has increased to a level that is not fully supported by its earnings potential. This situation can occur due to various factors, including speculative trading, market optimism about the company's future prospects, or general market overvaluation. Investors might pay a premium for the stock based on expectations of future growth, which may or may not materialize. Therefore, a careful analysis of the reasons behind the high P/E ratio is essential before making investment decisions.

B is incorrect. This option suggests that the stock is undervalued. An undervalued stock is one where the actual P/E ratio is lower than the expected P/E ratio. This would mean that the stock is trading at a price lower than what its earnings can justify. However, in the given scenario, the actual P/E ratio is higher than the expected P/E ratio, indicating that the stock is overvalued, not undervalued.

C is incorrect. This option suggests that the stock is correctly valued. A correctly valued stock is one where the actual P/E ratio matches the expected P/E ratio. This would mean that the stock's market price is in line with its earnings potential, and there is no significant discrepancy between the price investors are willing to pay and the earnings the company is expected to generate. However, in the given scenario, the actual P/E ratio is higher than the expected P/E ratio, indicating that the stock is overvalued, not correctly valued.

CFA Level 1, Topic 4 - Equity Investments, Learning Module 8: Equity Valuation: Concepts and Basic Tools, LOS 8k: Calculate and interpret the following multiples: price to earnings, price to an estimate of operating cash flow, price to sales, and price to book value.

Q.4 Birmu Corporation has the following:

- Debt/equity ratio of 0.5

- Birmu is a constant growth firm that just paid a dividend of $3.25

- Stocks sell for $48.25 per share, and analysts predict a growth rate of 5%

- Bonds are currently yielding 7%

- Marginal tax rate is 30%

Birmu's after-tax cost of capital is *closest to*:

A. 7.27%

B. 9.68%

C. 10.38%

TThe Weighted Average Cost of Capital (WACC) is a measure of the average rate of return a company is expected to provide to all its security holders. The formula for WACC is:

$$\text{WACC} = \frac{E}{V} \times r_e + \frac{D}{V} \times r_d \, (1 - \text{Tax Rate})$$

Where E is the market value of equity, V is the total market value of equity and debt, r_e is the cost of equity, D is the market value of debt, and r_d is the cost of debt. In this case, we have:

$$E = \frac{1}{0.5 + 1} = \frac{1}{1.5}$$
$$D = \frac{0.5}{0.5 + 1} = \frac{0.5}{1.5}$$
$$V = 1.5$$
$$P_0 = \frac{D_0 \, (1 + g)}{K_e - g}$$
$$r_e = \frac{D_0 \, (1 + g)}{P_0} + g = \frac{3.25 \times 1.05}{48.25} + 0.05 = 0.1207$$
$$\Rightarrow \text{WACC} = \frac{1}{1.5} \times (0.1207) + \frac{0.5}{1.5} \times (0.07) \times (1 - 30)$$
$$= 0.0968 = 9.68\%$$

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.5 Regarding target customers of a firm as outlined in the business model, which of the following is *least likely* considered?

A. Type of price discrimination.

B. Target demographic segments.

C. The target customer segments that will be served.

Price discrimination is not typically a primary consideration when defining a firm's target customers within its business model. Price discrimination is a strategy that involves charging different prices to different customers for the same product or service. The factors that influence these price differences can include the customer's willingness to pay, the quantity of the product they purchase, or the market segment they belong to. While this strategy is an important part of a firm's pricing model, it is not directly related to the process of identifying target customers. Instead, it is a subsequent step that comes after the target customers have been identified and understood. Therefore, it is less likely to be considered in the initial stages of outlining a firm's target customers.

B is incorrect. The target demographic segments are a vital part of defining a firm's target customers. These demographic segments can encompass a variety of factors, including age, gender, income level, education, and more. By understanding these aspects of their potential customers, a firm can tailor its products, marketing strategies, and services to meet the specific needs and preferences of its target market. This understanding can help the firm to attract and retain customers, increase sales, and improve customer satisfaction. Therefore, target demographic segments are highly likely to be considered when outlining a firm's target customers in its business model.

C is incorrect. Identifying the target customer segments that will be served is a fundamental aspect of a firm's business model. This involves specifying the particular groups of customers that the firm aims to reach. These groups could be defined based on a variety of criteria, such as their behavior, needs, or other characteristics. By knowing who its target customer segments are, a firm can design and implement effective marketing strategies, develop products or services that meet the specific needs of these customers, and ultimately achieve a competitive advantage in the market. Therefore, the identification of target customer segments is a crucial step in outlining a firm's target customers in its business model.

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

Q.6 Which of the following is *most likely* an example of a variable cost?

 A. Insurance costs.

 B. Depreciation and amortization.

 C. Materials and direct labor costs for a manufacturer.

Variable costs are those that fluctuate in direct proportion to the volume of output. In simpler terms, if production increases, variable costs also increase, and vice versa. For a manufacturer, the cost of materials and direct labor are directly linked to the number of units produced. If the production of units increases, it necessitates more materials and labor, thereby increasing the cost. This direct relationship between cost and production volume is the defining characteristic of variable costs.

A is incorrect. Fixed costs are those that remain constant over a certain period, such as a year, regardless of the level of production or sales. For instance, a company's insurance costs are typically set for a certain period and do not change with the level of production or sales. This lack of correlation between cost and production volume is what distinguishes fixed costs from variable costs.

B is incorrect. Depreciation and amortization are examples of fixed costs, not variable costs. These costs are incurred irrespective of the level of production or sales. Depreciation refers to the systematic allocation of the cost of a tangible asset over its useful life, while amortization refers to the systematic allocation of the cost of an intangible asset over its useful life. Both depreciation and amortization do not change with the level of output or sales, making them fixed costs. This lack of correlation between cost and production volume is what distinguishes fixed costs from variable costs.

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

Q.7 KimTech Inc, a fictitious technology company, has 20 million shares outstanding and total debt of USD 100 million. Additionally, the company has USD 10 million in cash. If the share price is USD150 per share, the enterprise value of KimTech is *closest to*:

 A. USD 3.00 billion.

 B. USD 3.09 billion.

 C. USD 3.11 billion.

The enterprise value of a company is a measure of its total value, taking into account not only the market value of its shares, but also its debt and cash holdings. The formula for calculating enterprise value is as follows:

$$\text{Enterprise value} = \text{Market value of shares} + \text{Market value of debt} - \text{Cash}$$

In the case of KimTech Inc, the market value of shares, also known as market capitalization, is calculated by multiplying the current stock price by the total number of shares outstanding. This gives us:

$$\text{Market capitalization} = \text{Current stock price} \times \text{Total shares outstanding} = 20 \times 150 = \text{USD 3 billion}$$

Adding the market value of debt (USD 100 million) and subtracting the cash (USD 10 million) from the market capitalization, we get the enterprise value:

$$\text{Enterprise value} = 3 + 0.1 - 0.01 = \text{USD 3.09 billion}$$

This is why option **B is the correct answer**.

A is incorrect. This option represents the market capitalization of KimTech Inc, which is USD 3 billion. However, the enterprise value is not just the market capitalization, but also takes into account the company's debt and cash holdings. Therefore, option A underestimates the total value of the company.

C is incorrect. This option incorrectly adds the cash to the sum of the market value of shares and debt, instead of subtracting it. The correct calculation should be:

$$3.0 + 0.1 - 0.01 = 3.09$$

However, option C calculates it as:

$$3.0 + 0.1 + 0.01 = 3.11$$

This is why option C overestimates the total value of the company.

CFA Level 1, Topic 4 – Equity, Learning Module 8– Equity Valuation: Concepts and Basic Tools, LOS 8k: Describe enterprise value multiples and their use in estimating equity value

Q.8 Which of the following is *most likely* the primary purpose of company and industry analysis in forming a view of an issuer's future financial results?

     A. Predict the exact future earnings and cash flows.

     B. Provide a mathematical model for future financial results.

     C. Support and justify the analyst's forward-looking views.

The primary purpose of company and industry analysis in forming a view of an issuer's future financial results is to support and justify the analyst's forward-looking views. Company and industry analysis involves a detailed examination of a company's financial statements, its competitive position in the industry, and the overall health of the industry. This analysis helps an analyst to form an opinion about the company's future financial performance.

The analyst uses this information to make predictions about the company's future earnings, cash flows, and other financial results. These predictions are not exact, but they are based on the analyst's understanding of the company and its industry. The analysis provides the evidence and reasoning that support these predictions. Therefore, the main purpose of company and industry analysis is to provide a solid foundation for the analyst's forward-looking views about a company's financial future.

A is incorrect. While company and industry analysis does involve making predictions about a company's future earnings and cash flows, the purpose of this analysis is not to predict the exact future earnings and cash flows. Predicting exact future financial results is impossible due to the inherent uncertainty in business and economic conditions.

B is incorrect. Company and industry analysis does not provide a mathematical model for future financial results. While quantitative methods are used in the analysis, the purpose of the analysis is not to create a mathematical model but to understand the company's financial condition and prospects. The analysis involves a combination of quantitative and qualitative methods, and the results are interpreted in the context of the company's specific situation and the conditions in its industry.

CFA Level I, Topic 6 - Equity, Learning Module 5: Company Analysis: Past and Present. LOS (b): determine a company's business model.

Q.9 Using Company A's income statement, its degree of operating leverage is *closest to*:

	$ millions (20X3)	$ millions (20X2)
Revenue	430	375
Cost of goods sold	132	112
Selling, general and administrative expenses	33	36
Research and development expenses	24	22
Interest expense	23	18
Other (Income)/expenses	(12)	9
Income before income taxes	230	178
Provision for income taxes	69	53.4
Net income	161	124.6

A. 1.19

B. 1.66

C. 1.99

The degree of operating leverage (DOL) is a measure of how a change in output volume will affect operating income (EBIT). It is used to evaluate the riskiness of a company's operating income stream. The DOL is calculated as the percentage change in operating income divided by the percentage change in sales. In this case, we are given the income statement of Company A for two years, 20X3 and 20X2, and we are asked to calculate the DOL.

First, we need to calculate the operating income for both years. For 20X3, the operating income is calculated as Revenue - Cost of goods sold - Selling, general and administrative expenses - Research and development expenses, which equals 430 - 132 - 33 - 24 = 241 million dollars. Similarly, for 20X2, the operating income is calculated as 375 - 112 - 36 - 22 = 205 million dollars.

Next, we calculate the DOL as the percentage change in operating income divided by the percentage change in sales. The percentage change in operating income is (241/205) - 1, and the percentage change in sales is (430/375) - 1. Therefore, the DOL is (241/205 - 1) / (430/375 - 1) = 1.19.

B is incorrect. The value of 1.66 is not the degree of operating leverage, but rather the degree of financial leverage (DFL). The DFL is a measure of how a change in operating income will affect earnings per share (EPS). It is calculated as the percentage change in net income divided by the percentage change in operating income. In this case, the DFL is calculated as (161/124.6 - 1) / (241/205 - 1) = 1.66.

C is incorrect. The value of 1.99 is not the degree of operating leverage, but rather the degree of total leverage (DTL). The DTL is a measure of how a change in output volume will affect earnings per share (EPS). It is calculated as the product of the DOL and the DFL. In this case, the DTL is calculated as 1.19 * 1.66 = 1.99.

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

Q.10 Project Red and Project Blue are two mutually exclusive projects whose projected cash flows are given in the following table:

Year	Project Red	Project Blue
0	−800,000	−800,000
1	600,000	60,000
2	300,000	300,000
3	60,000	600,000

Using a required rate of return of 8% on both projects, the project(s) that will *most likely* increase value is/are:

      A. Project Red.

      B. Project Blue.

      C. Project Red and Project Blue.

The Net Present Value (NPV) of Project Red is higher than that of Project Blue. NPV is a key metric in capital budgeting and investment appraisal. It measures the profitability of a project by comparing the present value of expected future cash inflows with the present value of all expected future cash outflows. The project with the higher NPV is considered more profitable and is therefore chosen over other projects.

Let's calculate the NPV of both projects using a financial calculator. For Project Red, the cash flows are as follows: CF0=-800,000, CF1=600,000, CF2=300,000, CF3=60,000. After inputting these values into the calculator, we set the interest rate (I) as 8% and compute the NPV. The result is 60,387. This positive NPV indicates that the present value of future cash inflows from Project Red is greater than the present value of the cash outflows, making it a profitable project.

For Project Blue, the cash flows are: CF0=-800,000, CF1=60,000, CF2=300,000, CF3=600,000. Using the same process as above, we find that the NPV of Project Blue is -10,943. This negative NPV indicates that the present value of future cash inflows from Project Blue is less than the present value of the cash outflows, making it an unprofitable project.

B is incorrect. Project Blue is not the most likely to increase value. This is because its NPV is negative, indicating that the present value of its future cash inflows is less than the present value of its cash outflows. In other words, the project is expected to result in a net loss, not a net gain. Therefore, it would not be a wise investment decision to choose Project Blue over Project Red.

C is incorrect. Both Project Red and Project Blue cannot be selected as they are mutually exclusive projects. In the context of capital budgeting, mutually exclusive projects are those where the acceptance of one project excludes the acceptance of the other. Since Project Red has a higher NPV, it is the more profitable project and should be chosen over Project Blue.

CFA Level 1, Topic 4 – 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.11 Company A is launching a new product with a large marketing campaign that will cost $2 million. To finance the project, the CEO has received the following information from the finance department:

Required return on equity	21%
Before-tax required on debt	9%
Company A's tax bracket	35%

If the CEO decides to sell 25 million dollars in new debt and to issue 14 million dollars in common stock, the marginal weighted average cost of capital (WACC) should be *closest to*:

A. 11.30%.

B. 13.32%.

C. 15.55%.

The eighted average cost of capital (WACC), also known as the marginal cost of capital is calculated by taking a weighted average of the marginal costs of each of the various sources of capital for a company.

The formula for the WACC is as follows:

$$\text{WACC} = W_d r_d (1 - t) + W_p r_p + W_e r_e$$

Where:

w_d = the proportion of debt that a company uses whenever it raises new funds.

r_d = the before-tax marginal cost of debt.

t = the company's marginal tax rate.

w_p = the proportion of preferred stock that the company uses when it raises new funds.

r_p = the marginal cost of preferred stock.

w_e = the proportion of equity that the company uses when it raises new funds.

r_e = the marginal cost of equity.

The first step in the calculation is to add the issued capital. The total issued capital will help us determine the weighted average of each source of capital. In this case, the total issued capital is $39 million, which is the sum of $25 million in new debt and $14 million in common stock. This gives us the proportions of debt and equity as 0.64 and 0.36 respectively.

Substituting these values into the WACC formula, we get:

$$\begin{aligned} \text{WACC} &= (0.64)(9\%)(1-0.35) \ + \ (0.36)(21\%) \\ &= \ 3.74\% \ + \ 7.56\% \\ &= \ 11.30\% \end{aligned}$$

B is incorrect. The value of 13.32% has been incorrectly obtained by using the before-tax cost of debt instead of the after-tax cost of debt. For debt, we must first calculate the after-tax cost of debt by multiplying the before-tax cost by one minus the tax rate. This error in calculation leads to an inflated WACC.

C is incorrect. The value of 15.56% has been incorrectly obtained by mixing up the costs of equity and debt, using the cost of equity instead of the cost of debt and vice versa. This error in calculation leads to a significantly inflated WACC.

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.12 An analyst calculates that shares of ABC are trading at a lower price than their intrinsic value. This analyst would *most likely* conclude that ABC is:

    A. overvalued.

    B. fairly Valued.

    C. undervalued.

The analyst's conclusion that shares of ABC are trading at a lower price than their intrinsic value indicates that the shares are undervalued. This is based on the fundamental principle of market and intrinsic value. Market value is the current price at which an asset can be bought or sold in the market. It is determined by the forces of supply and demand in the market and can fluctuate over time. On the other hand, intrinsic value is the inherent worth of an asset, calculated based on its fundamental characteristics and potential for future earnings. It is a theoretical value that investors aim to determine through thorough analysis and evaluation of the asset's underlying factors.

When the market value of an asset is lower than its intrinsic value, it suggests that the asset is priced less than what it is actually worth. This is a signal to investors that the asset is undervalued, and it may be a good opportunity to buy. The analyst, in this case, has determined that the intrinsic value of ABC shares is higher than their current market price, leading to the conclusion that the shares are undervalued.

A is incorrect. The term overvalued is used when the market price of an asset is higher than its intrinsic value. This means that the asset is priced more than its actual worth. In this scenario, the analyst has determined that the market price of ABC shares is lower than their intrinsic value, not higher. Therefore, the shares cannot be considered overvalued.

B is incorrect. A fairly valued asset is one where the market price is equal to its intrinsic value. This means that the asset is priced exactly at its actual worth. In this case, the analyst has determined that the market price of ABC shares is lower than their intrinsic value, not equal. Therefore, the shares cannot be considered fairly valued.

CFA Level 1, Topic 5 – Equity, Learning Module 8 – Equity Valuation: Concepts and Basic Tools, LOS 8a: Evaluate whether security, given its current market price and a value estimate, is overvalued, fairly valued, or undervalued by the market.

Q.13 Collin Company's next year's EPS estimate is €2.5 per share. The return on equity is 10%. If the company's dividend payout ratio is 60% and the investors' required rate of return is 9%, then the intrinsic value of Collin Company is *closest to*:

    A. € 30.00.

    B. € 33.40.

    C. € 39.65.

The intrinsic value of Collin Company can be calculated using the Price to Earnings ratio (P/E ratio) and the Earnings per Share (EPS). The P/E ratio is a financial metric used for determining the market value per share relative to the company's earnings per share. In this case, we are given the EPS, but not the P/E ratio. Therefore, we need to calculate the P/E ratio first.

The formula for the P/E ratio is as follows:

$$\text{Price to earnings ratio} = \frac{\text{Share price}}{\text{Earnings per share (EPS)}}$$

However, since we don't have the share price, we need to use the Forward P/E ratio, which is calculated as follows:

$$\text{Forward P/E} = \frac{\text{Dividend Payout Ratio}}{\text{Required rate of return-Growth rate}}$$

Before we can calculate the Forward P/E, we need to calculate the growth rate. The growth rate is calculated as follows:

$$\text{Growth rate} = (1\text{-Dividend payout ratio}) \times \text{Return on equity} = (1 - 0.6) \times 0.10 = 0.04$$

With the growth rate calculated, we can now calculate the Forward P/E:

$$\text{Forward P/E} = \frac{0.6}{0.09 - 0.04} = 12$$

Finally, we can calculate the stock price, which is the intrinsic value of Collin Company:

$$\text{Stock Price} = 12 \times 2.5 = 30$$

CFA Level 1, Topic 5 – Equity, Learning Module 8 – Equity Valuation: Concepts and Basic Tools, LOS 8j: Calculate and interpret the following multiples: price to earnings, price to an estimate of operating cash flow, price to sales, and price to book value.

Q.14 A company has recently announced an annual dividend on its stock of $0.78. Analysts believe the dividends are expected to grow at an annual rate of 4% for 5 years and then 2% thereafter. If the required rate of return on equity is 8 percent, then the intrinsic value of the share of stock is closest to:

    A. 3.49.

    B. 16.13.

    C. 14.49.

The intrinsic value of the share of stock is closest to option C, which is 14.49. This is calculated using a two-stage dividend discount model, which takes into account a high-growth period and a stable-growth period. The model is used to calculate the present value (PV) of dividends during these two periods.

Firstly, the PV of income during the high-growth period is calculated. This is done by discounting the dividends expected to be received in the next 5 years at the required rate of return on equity. The formula used is:

$$\text{PV} = \frac{0.78(1.04)}{1.08} + \frac{0.78(1.04)^2}{1.08^2} + \frac{0.78(1.04)^3}{1.08^3} + \frac{0.78(1.04)^4}{1.08^4} + \frac{0.78(1.04)^5}{1.08^5}$$

The result of this calculation is $3.49.

Secondly, the PV of income during the stable-growth period is calculated. This is done by first calculating the value of the stock at the end of the high-growth period using Gordon's Growth Model formula, and then discounting this value back to the present. The formula used is:

$$\text{PV at time 5} = V_5 = \frac{D_{n+1}}{r - g_l} = \frac{0.78 \times (1.04)^5 \times 1.02}{0.08 - 0.02}$$

The result of this calculation is $16.13. This value is then discounted back to the present using the formula:

$$\text{PV at time 0} = \frac{16.13}{1.08^5}$$

The result of this calculation is $11.

Finally, the PVs of the high-growth and stable-growth periods are summed up to get the intrinsic value of the share of stock. This is done using the formula:

$$3.49 + 11 = 14.49$$

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.15 A price-weighted index is composed of 4 stocks. Stock A trades at $21, stock B at $142, stock C at $34, and stock D at $602. One year later, stock A is now worth $24, stock B is $210, stock C is $12, and stock D is $610. The total return for this index is *closest to*:

    A. -8.01%.

    B. 8.01%.

    C. 7.13%.

The formula for total return is:

$$\text{Total Return} = \frac{T_1 - T_n}{T_n} \times 100\%$$

Where:

- T_1 is the final value of the investment,

- T_n is the initial value of the investment,

- $T_1 - T_n$ is the net return on the investment.

In this case, the initial value of the investment (T_n) is the sum of the initial prices of the four stocks:

$$T_n = 21 + 142 + 34 + 602 = 799$$

The final value of the investment (T_1) is the sum of the final prices of the four stocks:

$$T_1 = 24 + 210 + 12 + 610 = 856$$

Now, applying the total return formula:

$$\text{Total Return} = \frac{856 - 799}{799} \times 100\% = \frac{57}{799} \times 100\% \approx 7.13\%$$

CFA Level 1, Topic 5 – Equity, Learning Module 2 – Security Market Indexes, LOS 2b: Calculate and interpret the value, price return, and total return of an index.

Q.16 A finance student wants to create an index with the stock he bought in a paper trading account. The notes from his record show the following:

Stock	Initial Price	Current Price
Stock A	$10	$15
Stock B	$15	$30

Assuming an initial index value of 105, the equal-weighted index value for the two stocks is now *closest to*:

    A. 75.00.

    B. 150.00.

    C. 183.75.

The question is about calculating the equal-weighted index value for two stocks. The equal-weighted index is a type of stock market index in which each component of the index is given equal importance. In this case, the two stocks are Stock A and Stock B.

First, we need to calculate the price change in both stocks. For Stock A, the initial price was $10 and the current price is $15. This gives us a price change of 50%. For Stock B, the initial price was $15 and the current price is $30, giving us a price change of 100%.

Next, we calculate the average percentage change in the index. This is done by adding the percentage changes of both stocks and dividing by the number of stocks, which in this case is 2. So, (50% + 100%) / 2 = 75%.

Finally, we calculate the new index value. The initial index value was 105. We add the percentage change to 1 (1 + 75%) and multiply this by the initial index value. So, 105 * (1 + 75%) = 183.75.

A is incorrect. A value of 75 would imply that the index value has decreased, which is not the case here. The price of both stocks has increased, so the index value should also increase. Therefore, 75 is not the correct answer.

B is incorrect. A value of 150 would imply a smaller percentage increase in the index value than what we have calculated. The average percentage change in the index is 75%, which when applied to the initial index value of 105, gives a new index value of 183.75, not 150. Therefore, 150 is not the correct answer.

CFA Level I, Topic 5 - Equity, Learning Module 2: Security Market Indices, LOS 6e: Calculate and analyze the value and return of an index given its weighting method.

Q.17 Which of the following is *least likely* an assumption of the Gordon model?

      A. The growth rate of the dividend is increasing.

      B. Dividends are appropriate measures of shareholders' wealth.

      C. The return on the stock is greater than the constant dividend growth rate.

The Gordon Growth Model, also known as the Dividend Discount Model (DDM), is a method for calculating the intrinsic value of a stock, exclusive of current market conditions. The model assumes that dividends will continue to be paid and grow at a constant rate, indefinitely. The model also assumes that the return on the stock is greater than the constant dividend growth rate. This is because the model is based on the present value of future dividends, and if the return on the stock is less than the growth rate of the dividends, the present value of the dividends would be negative, which is not possible.

Option A is not an assumption of the Gordon model. The Gordon model assumes a constant growth rate for dividends, not an increasing one. An increasing growth rate would imply that dividends are growing at an accelerating pace, which is not sustainable in the long run. This is more in line with the assumptions of a multistage dividend discount model, which allows for different growth rates at different stages of the company's life cycle.

B is incorrect. The statement that dividends are appropriate measures of shareholders' wealth is actually an assumption of the Gordon model. The model is based on the premise that the value of a stock is equal to the present value of its future dividends. Therefore, dividends are seen as an appropriate measure of shareholders' wealth. This assumption is necessary for the model to work, as it relies on dividends as the primary source of return for shareholders.

C is incorrect. The statement that the return on the stock is greater than the constant dividend growth rate is also an assumption of the Gordon model. This assumption is necessary to ensure that the present value of future dividends is positive. If the return on the stock were less than the dividend growth rate, the present value of the dividends would be negative, which is not possible.

CFA Level 1, Topic 5 – Equity, Learning Module 8 – Equity Valuation: Concepts and Basic, LOS 8g: Calculate and interpret the intrinsic value of an equity security based on the Gordon (constant) growth dividend discount model or a two-stage dividend discount model, as appropriate Arbitrage will most likely happen in security markets.

Q.18 An investor buys 150 shares of a stock on margin at $178/share using an initial leverage ratio of $\frac{1}{2}$. At what stock price will he receive a margin call if the maintenance margin requirement for the position is 20%?

    A. $35.60.

    B. $111.25.

    C. $137.43.

The the investor will receive a margin call when the stock price is $111.25. This is determined by the calculation of the leverage ratio and the initial equity per share. The leverage ratio is given as 0.5, which is the fraction of the total investment that the investor has borrowed. The initial equity per share is calculated by multiplying the leverage ratio by the initial stock price, which is $178. This gives us an initial equity per share of $89.

Next, we calculate the price at which the investor will receive a margin call. This is done by setting up the equation for the maintenance margin requirement, which is given as 20%. The equation is set up as follows: (Initial equity per share + P - Initial stock price) / P = Maintenance margin requirement. Substituting the given values into the equation, we get: ($89 + P - $178) / P = 0.20. Solving this equation for P, we get P = $111.25. This means that the investor will receive a margin call when the stock price falls to $111.25.

A is incorrect. This option suggests that the investor will receive a margin call when the stock price is $35.60. However, this is not correct as per the calculation explained above. The margin call price is determined by the initial equity per share, the initial stock price, and the maintenance margin requirement. Using these values, we calculated the margin call price to be $111.25, not $35.60. Therefore, option A is incorrect.

C is incorrect. This option suggests that the investor will receive a margin call when the stock price is $137.43. However, this is not correct as per the calculation explained above. The margin call price is determined by the initial equity per share, the initial stock price, and the maintenance margin requirement. Using these values, we calculated the margin call price to be $111.25, not $137.43. Therefore, option C is incorrect.

CFA Level 1, Topic 5 – Equity, 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.19 An investor can achieve positive risk-adjusted returns on average by using the fundamental analysis trading strategy in which of the following forms of market efficiency?

    A. Weak form efficiency only.

    B. Strong form efficiency only.

    C. Weak and semi-strong form efficiency only.

In a weak form efficient market, current prices reflect all past market information. This includes the historical sequence of prices, rates of return, trading volume data, and other market-generated information. Therefore, in such a market, investors can use fundamental analysis to achieve positive risk-adjusted returns. Fundamental analysis involves evaluating a company's financial statements, health, and competitors and markets. It also often involves evaluating the overall health of the economy. Therefore, in a weak form efficient market, where all past market information is reflected in the current prices, fundamental analysis can be used to achieve positive risk-adjusted returns.

B is incorrect. The strong form of market efficiency suggests that all information, public or private, is accounted for in a stock's price. Neither technical nor fundamental analysis can be used to achieve superior gains. In a strong form efficient market, even insider information cannot be used to achieve abnormal returns. This is because all information, whether public or private, is already reflected in the current prices. Therefore, even if an investor has insider information, they cannot use it to achieve superior gains because the information is already accounted for in the current prices. Hence, an investor cannot achieve positive risk-adjusted returns on average by using the fundamental analysis trading strategy in strong form efficiency only.

C is incorrect. The semi-strong form of market efficiency suggests that all public information is accounted for in a stock's price. Therefore, neither technical analysis nor fundamental analysis can be used to achieve superior gains. In a semi-strong form efficient market, all publicly available information is already reflected in the current prices. Therefore, even if an investor uses fundamental analysis, they cannot use it to achieve superior gains because the information is already accounted for in the current prices. Hence, an investor cannot achieve positive risk-adjusted returns on average by using the fundamental analysis trading strategy in weak and semi-strong form efficiency only.

CFA Level 1, Topic 5 - Equity Investments, Learning Module 3: Market Efficiency, LOS 3d: Contrast weak-form, semi-strong-form, and strong-form market efficiency.

Q.20 A company plans to invest $14.3 million in a project, which is expected to generate $3.7 million per year in each of the next 7 years. The company's opportunity cost of capital is 8%. The project's NPV is *closest to*:

    A. $4,343,123.10.

    B. $4,963,569.20.

C. $19,263,569.22.

The NPV (Net Present Value) is calculated using the formula:

$$\text{NPV} = -\text{Initial Investment} + \left(\frac{\text{Annual Cash Flow} \times (1 - (1 + \text{Discount Rate})^{-\text{Number of Years}})}{\text{Discount Rate}}\right)$$

In this case:

- Initial Investment = \$14.3 million

- Annual Cash Flow = \$3.7 million

- Discount Rate = 8% or 0.08

- Number of Years = 7

Substituting these values into the formula:

$$\text{NPV} = -14.3 + \left(\frac{3.7 \times (1 - (1 + 0.08)^{-7})}{0.08}\right)$$

First, calculate the term $(1 + 0.08)^{-7}$:

$$(1 + 0.08)^{-7} = 0.58349$$

Now calculate the NPV:

$$\text{NPV} = -14.3 + \frac{3.7 \times (1 - 0.58349)}{0.08}$$

$$\text{NPV} = -14.3 + \frac{3.7 \times 0.41651}{0.08}$$

$$\text{NPV} = -14.3 + \frac{1.54109}{0.08}$$

$$\text{NPV} = -14.3 + 19.2636$$

$$\text{NPV} = 4.9636 \, \text{million}$$

A is incorrect. This option suggests that the NPV of the project is $4,343,123.10. However, using the NPV formula or the financial calculator as described above, we find that the NPV is

actually $4,963,569.20.

C is incorrect. This option suggests that the NPV of the project is $19,263,569.22. However, this value is not the NPV but the present value of the cash flows. The present value of the cash flows is the sum of the cash flows discounted back to the present at the discount rate. It does not take into account the initial investment, which is subtracted in the NPV calculation.

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

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Q.21 In a market where three firms hold market shares of 60%, 30%, and 10%, the Herfindahl-Hirschman Index (HHI) is *closest to*:

    A. 1800

    B. 4500

    C. 4600

The Herfindahl-Hirschman Index (HHI) is a commonly used measure of market concentration. It is calculated 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. If there is only one firm in the industry, that firm has 100% of the market share, and the HHI is 10,000 (100^2). If there are a large number of firms in the industry, each with a market share close to zero, the HHI is close to zero. The closer the HHI is to 10,000, the more concentrated the industry.

In this case, we have three firms with market shares of 60%, 30%, and 10%. To calculate the HHI, we square each of these market shares and then sum them up. This gives us:

$$60^2 + 30^2 + 10^2 = 3600 + 900 + 100 = 4600$$

So, the HHI for this market is 4600, which indicates a high level of market concentration. This means that the market is dominated by a few firms, which could lead to less competition and potentially higher prices for consumers.

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

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Q.22 Which of the following statements is *most likely* correct regarding the weak-form efficient market hypothesis?

      A. Security prices fully reflect all past market data.

      B. Security prices fully reflect all types of information.

      C. Security prices reflect all publicly known and available information.

The security prices fully reflect all past market data is in line with the weak-form efficient market hypothesis. According to this hypothesis, all historical prices of securities have already been reflected in the market prices of securities. This means that technicians, who trade based on the analysis of historical trading information, should not be able to earn abnormal returns. The weak-form efficient market hypothesis suggests that the market is efficient in reflecting all past publicly available information. Therefore, any trading strategy based on historical price trends or patterns is unlikely to provide investors with extraordinary profits. This is because any information from past price trends is already incorporated into current prices.

B is incorrect. This option suggests that security prices fully reflect all types of information. However, this is not consistent with the weak-form efficient market hypothesis. Instead, this statement is more aligned with the strong form of market efficiency. In the strong form of market efficiency, security prices reflect all information, including past market data, publicly available information, and even private or insider information. Therefore, option B is incorrect as it overstates the level of information reflected in security prices according to the weak-form efficient market hypothesis.

C is incorrect. This option states that security prices reflect all publicly known and available information. This statement is more in line with the semi-strong form of market efficiency. In the semi-strong form of market efficiency, security prices reflect all publicly available information. This includes not only past market data but also other public information such as financial statements, economic factors, and news events. Therefore, option C is incorrect as it also overstates the level of information reflected in security prices according to the weak-form efficient market hypothesis.

CCFA Level 1, Topic 5 –Equity, Learning Module 3 – Market Efficiency, LOS 3d: Contrast weak-form, semi-strong-form, and strong-form market efficiency.

Q.23 Which of the following is *most likely* explains why the Historical Base Rates and Convergence forecast Approach is not suitable for companies in highly cyclical industries?

    A. It requires a longer-term base rate and smooth convergence to it, which would obscure year-to-year volatility.

    B. It requires a short-term base rate and rapid convergence it, which would highlight year-to-year volatility.

    C. It requires a medium-term base rate and moderate convergence to it, which would neither obscure nor highlight year-to-year volatility.

The Historical Base Rates and Convergence Forecast Approach is not suitable for companies in highly cyclical industries because it requires a longer-term base rate and smooth convergence to it, which would obscure year-to-year volatility. Highly cyclical industries are characterized by significant fluctuations in performance and profitability due to economic cycles. These industries can experience periods of rapid growth followed by periods of contraction.

B is incorrect. The Historical Base Rates and Convergence forecast Approach does not require a short-term base rate and rapid convergence to it. This would highlight year-to-year volatility, which is not the objective of this approach. This approach is designed to provide a long-term perspective and smooth out short-term fluctuations, not to highlight them.

C is incorrect. The Historical Base Rates and Convergence forecast Approach does not require a medium-term base rate and moderate convergence to it. This would neither obscure nor highlight year-to-year volatility, which is not the objective of this approach. This approach is designed to provide a long-term perspective and smooth out short-term fluctuations, not to maintain a balance between obscuring and highlighting volatility.

CFA Level I, Topic 5, Equity, Learning Module 7: Company Analysis: Forecasting, LOS 7a: Explain principles and approaches to forecasting a company's financial results and position.

Q.24 Given that a company's common shares do not pay dividends, which of its securities will *most likely* offer the lowest expected return to investors?

     A. Common shares.

     B. Putable preferred shares.

     C. Callable preferred shares.

The expected return on an investment is directly proportional to the risk associated with it. This means that the higher the risk, the higher the expected return. This is because investors require a higher return to compensate for the increased risk. Therefore, the type of security and its features significantly influence its risk and return profile.

Putable preferred shares are a type of security that provides their holders with the right to sell back their shares to the issuing company at a predetermined price. This feature significantly reduces the risk for the investor because it provides a safety net in case the market price of the shares falls below the predetermined price. This reduced risk, in turn, leads to a lower expected return because investors do not require as high a return to compensate for risk. This is why putable preferred shares are likely to offer the lowest expected return to investors among the options provided.

A is incorrect. Common shares do not pay dividends, which means that the only return investors can expect from them is through capital gains, i.e., an increase in the share price. However, the price of common shares is highly volatile and can fluctuate significantly, leading to a higher risk. Therefore, to compensate for this increased risk, the expected return on common shares is higher than that on putable preferred shares.

B is incorrect. Callable preferred shares are a type of preferred shares that the issuer has the right to buy back at a predetermined price before their maturity date. This feature increases the risk for the investor because the issuer can choose to call back the shares when the market price is higher than the predetermined price, forcing the investor to sell at a lower price. Therefore, to compensate for this increased risk, the expected return on callable preferred shares is higher than that on putable preferred shares.

CFA Level 1, Topic 5 – Equity, Learning Module 4 – Overview of Equity Securities, LOS 6e: Compare the risk and return characteristics of different types of equity securities.

Q.25 Jessica Yang opens a margin account with an initial deposit of €5,000 to buy 500 shares of a bank stock at €22/share on margin. Her broker stated that her account requires a maintenance margin of 30%. Ignoring commissions and interests, calculate the margin call price.

    A. €3.56.

    B. € 4.86.

    C. €17.14.

A margin call is a broker's demand for an investor to deposit additional money or securities so that the margin account is brought up to the minimum maintenance margin. In this case, Jessica Yang's broker has set a maintenance margin of 30%. This means that the equity in Jessica's account must not fall below 30% of the current market value of the securities in the account.

Firstly, we need to calculate the initial margin requirement. Jessica deposits €5,000 to buy 500 shares of stock at €22 per share. This €5,000 is Jessica's initial margin. The initial margin requirement for this trade is calculated as (€5,000 / (500 * €22)) * 100% = 45.45%. This means that Jessica initially funded 45.45% of the purchase of the shares.

Next, we use the margin call price formula, which is (Original price * (1 - Initial margin)) / (1 - Maintenance margin). Substituting the given values into the formula, we get (€22 * (1 - 0.4545)) / (1 - 0.3) = €17.14. This is the price at which the equity in Jessica's account will fall to the maintenance margin of 30%, triggering a margin call.

CFA Level 1, Topic 5 – Equity, 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.26 David Smith owns 100 shares of Sprint Craft Inc., and the firm is going to elect 10 board directors. Under statutory voting, Smith can *most likely* cast:

    A. 1,000 votes for only one member in any desired proportion.

    B. A maximum of 100 votes for each member of the board.

    C. 100 votes and can spread them across candidates in any proportion.

Statutory voting is a voting system where each share corresponds to one vote, and these votes must be distributed evenly among the candidates or issues being voted on. In the context of the question, David Smith owns 100 shares of Sprint Craft Inc., and the firm is electing 10 board directors. Under statutory voting, Smith can cast a maximum of 100 votes for each board member. This is because each of his 100 shares corresponds to one vote, and these votes can be cast for each of the 10 board members, resulting in a total of 1,000 votes. However, it is important to note that under statutory voting, Smith cannot allocate his votes unevenly among the board members. For example, he cannot cast one vote for each of nine board members and 991 votes for the tenth member. This type of voting allocation is only possible under cumulative voting.

A is incorrect. This option suggests that Smith can cast 1,000 votes for only one member in any desired proportion. This is not possible under statutory voting, as this voting system requires votes to be divided evenly among the candidates. The ability to cast votes in any desired proportion is a characteristic of cumulative voting, not statutory voting. In cumulative voting, shareholders can allocate their votes in any way they choose, including casting all their votes for one candidate or distributing their votes unevenly among multiple candidates. Therefore, option A is incorrect because it incorrectly describes the characteristics of statutory voting.

C is incorrect. This option suggests that Smith can cast 100 votes and spread them across candidates in any proportion. This is not accurate for two reasons. First, under statutory voting, Smith can cast 100 votes for each of the 10 board members, not just 100 votes in total. Second, statutory voting does not allow shareholders to spread their votes across candidates in any proportion. As mentioned earlier, votes must be divided evenly among the candidates under statutory voting. The ability to spread votes across candidates in any proportion is a characteristic of cumulative voting, not statutory voting. Therefore, option C is incorrect because it inaccurately describes the voting rights of shareholders under statutory voting.

CFA Level 1, Topic 5 – Equity, Learning Module 4 – Overview of Equity Securities, LOS 4b: Describe differences in voting rights and other ownership characteristics among different equity classes.

Q.27 Which of the following derivatives are *least likely* traded through an exchange?

    A. Futures.

    B. Options.

    C. Forwards.

The forwards are typically not traded through an exchange. Instead, they are traded over-the-counter (OTC), which means they are traded directly between two parties, without the supervision of an exchange. This is due to the nature of forwards contracts, which are private agreements between two parties and thus, are not standardized like futures and options. The terms of a forwards contract, including its expiration date and the underlying asset, are customized to fit the specific needs of the two parties involved. This lack of standardization makes it difficult for forwards to be traded on an exchange, which requires standardization for efficient trading.

A is incorrect. Futures are not the least likely to be traded through an exchange. In fact, futures are one of the most commonly traded derivatives on exchanges. This is because futures contracts are standardized, meaning they have fixed expiration dates and standardized underlying assets. This standardization allows them to be easily traded on an exchange, where traders can buy and sell futures contracts with ease. Furthermore, trading futures on an exchange provides additional benefits such as increased transparency and reduced counterparty risk, making them a popular choice for many traders.

B is incorrect. Options, like futures, are also commonly traded on exchanges. Options contracts are standardized contracts that give the holder the right, but not the obligation, to buy or sell an underlying asset at a specified price before a certain date. The standardization of options contracts, along with the flexibility they offer to the holder, makes them suitable for exchange trading. Additionally, trading options on an exchange provides benefits such as increased market liquidity and reduced counterparty risk, making them a popular choice among many traders.

CFA Level 1, Topic 5 – Derivatives, Learning Module 1 – Derivative Instrument and Derivative Market Features, LOS 1b: describe the basic features of derivative markets, and contrast over-the-counter and exchange-traded derivative markets.

Q.28 Here is a comparative analysis of three company's price-to-earnings ratios:

Compnay A	2.1
Company B	3.5
Company C	3.2

Which of these companies is *most likely* undervalued considering that they are all operating in the same sector?

  A. Company A.

  B. Company B.

  C. Company C.

The price-to-earnings (P/E) ratio is a financial metric that is widely used to measure the relative valuation of companies. It is calculated by dividing the market value per share by earnings per share (EPS). A lower P/E ratio could mean that the stock is undervalued, or it could reflect a pessimistic outlook for the company's future earnings. However, it's important to compare P/E ratios among companies in the same industry, as different industries have different growth prospects and risk profiles.

In this case, all three companies are operating in the same sector, which allows for a fair comparison. Company A has a P/E ratio of 2.1, which is lower than Company B's P/E ratio of 3.5 and Company C's P/E ratio of 3.2. This suggests that, relative to its earnings, Company A's stock is priced lower than those of Companies B and C.

B is incorrect. Although Company B has a higher P/E ratio than Company A, this does not necessarily mean that it is overvalued. A higher P/E ratio could reflect higher growth prospects or a lower risk profile. Therefore, without additional information about the companies' growth prospects and risk profiles, it's not definitive that Company B is overvalued.

C is incorrect. Although Company C has a higher P/E ratio than Company A, this does not necessarily mean that it is overvalued. A higher P/E ratio could reflect higher growth prospects or a lower risk profile. Therefore, without additional information about the companies' growth prospects and risk profiles, it's not definitive that Company C is overvalued.

CFA Level 1, Topic 5 – Equity, Learning Module 8 – Equity Valuation: Concepts and Basic Tools – LOS 8j: Calculate and interpret the following multiples: price to earnings, price to an estimate of operating cash flow, price to sales, and price to book value.

Q.29 An investor buys 500 shares of a non-dividend-paying stock for $152. The initial margin requirement is 30%, and the maintenance margin is 20%. After one year, the investor sells the stock for $178 per share. The price at which the investor would receive a margin call is *closest to*:

    A. $133.

    B. $152.

    C. $156.

The investor will receive a margin call when the price of the stock drops below the maintenance margin requirement. This is because the maintenance margin is the minimum amount of equity that must be maintained in a margin account. When the value of the securities in the account falls below this level, the investor will receive a margin call, requiring them to either deposit more money into the account or sell some of the securities.

The formula to calculate the price at which the investor will receive a margin call is:

Margin Call = (Original Price * (1 - Initial Margin)) / (1 - Maintenance Margin)

Substituting the given values into the formula, we get:

Margin Call = (152 * (1 - 0.30)) / (1 - 0.20) = 133

B is incorrect. The price of $152 is the original price at which the investor bought the shares. However, this is not the price at which the investor will receive a margin call. The margin call price is calculated based on the initial margin and the maintenance margin, not the original price of the shares.

C is incorrect. The price of $156 seems to have been calculated by incorrectly assuming that the price at which the investor sells the shares is the original price of the shares. However, the selling price of the shares has no bearing on the price at which the investor will receive a margin call. The margin call price is determined by the initial margin and the maintenance margin, not the selling price of the shares.

CFA Level 1, Topic 5 – Equity, 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.30 Which of the following is *most likely* a primary source of liquidity for a firm?

      A. Lines of credit.

      B. Liquidating assets.

      C. Negotiating debt contracts.

Primary sources of liquidity are those funds that are readily available to a company at a relatively low cost. These sources are typically easy to access and do not significantly impact a company's financial and operating positions. They include cash available in bank accounts, short-term funds like lines of credit, and trade credit. These sources are considered primary because they are the first places a company would look to for liquidity when needed. Lines of credit, in particular, are a flexible source of funds that can be accessed as needed, making them a valuable tool for managing a company's cash flow.

B is incorrect. Liquidating assets is considered a secondary source of liquidity. Secondary sources of liquidity are those that a company would turn to when primary sources are not sufficient or available. These sources often have a significant impact on a company's financial and operating positions and can signal that a company's financial health is deteriorating. Liquidating assets, in particular, can be a costly and time-consuming process, and it often means that a company is in financial distress. Therefore, while liquidating assets can provide liquidity, it is not a primary source of liquidity.

C is incorrect. Negotiating debt contracts is also considered a secondary source of liquidity. This is because renegotiating debt contracts often comes with costs, such as fees and potentially higher interest rates. Furthermore, it can signal to creditors and investors that a company is in financial distress, which can impact its credit rating and ability to raise funds in the future. Therefore, while negotiating debt contracts can provide liquidity, it is not a primary source of liquidity.

CFA Level 1, Topic 5 – Corporate Issuers, Learning Module 4 – Working capital, LOS 4b: Explain liquidity and compare issuers' liquidity levels.

Q.31 Company ABC has total assets of $6.2 million with liabilities of $2.2 million. If its shares are trading for $17.78, and there are 450,000 outstanding shares in the markets, then ABC's book value is *closest to*:

    A. $4 million.

    B. $8 million.

    C. $5million.

The book value of a company is a key financial metric that represents the net value of a company's assets. It is calculated by subtracting the total liabilities from the total assets of the company. This value is significant as it provides an estimate of the amount that the shareholders would receive if the company were to be liquidated. In the context of Company ABC, the total assets are $6.2 million and the total liabilities are $2.2 million. Therefore, the book value can be calculated as follows:

$$\text{Book value} = \text{Total assets} - \text{Total liabilities}$$

$$\text{Book value} = \$6.2 \text{ million} - \$2.2 \text{ million} = \$4 \text{ million}$$

Thus, the book value of Company ABC is closest to $4 million.

B is incorrect. This option suggests that the book value of Company ABC is $8 million. However, as demonstrated in the calculation above, the book value is actually $4 million. The discrepancy might arise from a misunderstanding of the concept of book value or a miscalculation of the total assets and liabilities.

C is incorrect. This option indicates a book value of $5 million. This is not accurate as per the calculation above. The error could be due to a misinterpretation of the financial data or a miscalculation. It's also important to note that the book value is not influenced by the market value of the company, which is the value of the company's outstanding shares in the market. Therefore, the market value of $8 million does not affect the book value.

CFA Level 1, Topic 5 – Equity, Learning Module 4– Overview of Equity Securities, LOS 4g: Distinguish between the market value and book value of equity securities.

Q.32 A firm will start paying dividends four years from now, and after that, the dividend is expected to grow at the rate of 7% into perpetuity. The expected dividend in year 4 is $6. If the market's required rate of return for the stock is 12%, the intrinsic value of the stock is *closest to:*

    A. $80.08

    B. $85.41

    C. $128.40

The intrinsic value of a stock is calculated using the Gordon Growth Model, which is represented by the formula:

$$V_o = \frac{D_1}{r - g}$$

Where:

V_o = Intrinsic value of the stock.

D_1 = Expected dividends in year 1. This is obtained by multiplying the dividends in year zero by one plus the growth rate.

r = required rate of return.

g = growth rate.

Using this formula, we can calculate the intrinsic value of the stock in year 4:

$$V_4 = \frac{D_5}{k - g}$$
$$= \frac{6 \times (1 + 0.07)}{0.12 - 0.07} = 128.40$$

This gives us the intrinsic value of the stock in year 4. However, the question asks for the intrinsic value of the stock today. To find this, we need to discount year four's dividend and intrinsic value to year zero:

$$V_0 = \frac{D_4 + V_4}{(1 + 0.12)^4} = \frac{6 + 128.40}{(1 + 0.12)^4} = 85.41$$

This gives us the intrinsic value of the stock today, which is closest to $85.41.

CFA Level 1, Topic 5 – Equity, Learning Module 8 – Equity Valuation: Concepts and Basic Tools, LOS 8g: Calculate and interpret the intrinsic value of an equity security based on the Gordon (constant) growth dividend discount model or a two-stage dividend discount model, as appropriate.

Q.33 Which of the following is the *most appropriate* definition of inertia in relation to capital allocation pitfalls?

     A. Failing to consider alternative investments.

     B. Increasing capital investments every period with falling investment returns.

     C. Management considers internally generated capital differently from externally generated capital.

Inertia, in relation to capital allocation pitfalls, is best defined as the tendency of management to increase capital investments every period, even when investment returns are falling or remaining stagnant. This is the essence of option B. This pitfall arises due to the lack of adaptability and flexibility in the management's approach towards capital allocation. They continue to invest more capital, irrespective of the diminishing returns, which is not a financially sound decision. The management should be critically evaluating the returns on their investments and should be open to considering alternative uses of capital if the current investments are not yielding the expected returns.

A is incorrect. The statement 'Failing to consider alternative investments' does not define inertia in the context of capital allocation pitfalls. While it is true that not considering alternative investments is a pitfall in capital allocation, it does not align with the concept of inertia. Inertia refers to the resistance to change or the tendency to continue with the existing course of action. Not considering alternative investments is more about a lack of exploration and due diligence rather than inertia.

C is incorrect. The statement 'Management considers internally generated capital differently from externally generated capital' is more related to the bias in the source of capital rather than inertia. This bias can lead to inefficient capital allocation as management may treat internally generated capital as "free" compared to externally generated capital and allocate it similarly to previous periods. However, this does not reflect the concept of inertia, which is about the tendency to continue with the same course of action despite changing circumstances.

CFA Level I, Topic 5 - Corporate Issuers, Learning Module 5: Capital Investments and Capital Allocation. LOS 5c: Describe principles of capital allocation and common capital allocation pitfalls.

Q.34 BCG Bank has a one-month Value at Risk (VaR) of $600 million with a probability of 7%, which means:

A. A one-month maximum loss of $600 million will occur 7% of the time.

B. A one-month minimum loss of $600 million will occur 7% of the time.

C. A loss of $600 million will occur one month from now.

Value at Risk (VaR) is a measure of the potential loss on a portfolio of assets, given a certain level of confidence and a specific period of time. In this case, BCG Bank has a one-month VaR of $600 million with a probability of 7%.
Another way to interpret a one-month VaR of $600 million with a probability of 7% is that, there is a 7% chance that the bank will experience a minimum loss of $600 million over the course of one month. This means that the bank's portfolio of assets has a 93% chance of not losing more than $600 million over the same period.

A is incorrect. This option suggests that a one-month maximum loss of $600 million will occur 7% of the time. However, this interpretation is slightly misleading. VaR does not predict the maximum loss but rather the minimum loss at a certain confidence level. Therefore, stating it as a "maximum" loss does not accurately represent the concept of VaR, which is focused on the threshold that losses are not expected to exceed only 7% of the time, implying that losses could be greater than $600 million but not less, within the specified period.

C is incorrect. This option implies that a loss of $600 million is certain to occur one month from now, which misinterprets the probabilistic nature of VaR. VaR provides a measure of potential loss at a specific confidence level (in this case, 7%) but does not predict when a loss will occur. It indicates the risk of experiencing a loss of at least $600 million within a one-month period, but it does not guarantee that such a loss will happen in the next month. The essence of VaR is in its ability to quantify risk in terms of both the size of the potential loss and the probability of that loss occurring, not in forecasting specific losses for specific future periods.

CFA Level I, Topic 5, Portfolio Management, Learning Module 6: Introduction to Risk Management, LOS 6d: Explain how risk tolerance affects risk management.

Q.35 Which of the following reasons is *least likely* a reason why a company's capital structure targets use book value instead of market value?

      A. Market values change dramatically.

      B. Lenders and rating agencies use book values in their calculations.

      C. The amounts and types of capital invested by the company is not of significance.

The amounts and types of capital invested by a company are indeed of significant importance. This information is derived from the book values, which are a more stable and reliable source of data for financial analysis and decision-making. The book value of a company's assets and liabilities provides a clear picture of its financial health and stability, which is crucial for making informed decisions about capital investments. Therefore, the assertion that the amounts and types of capital invested by the company are not of significance is incorrect.

A is incorrect. The statement that market values change dramatically is true, but this is actually a reason why companies might prefer to use book values instead of market values in their capital structure targets. Market values can be volatile and subject to fluctuations due to various external factors such as economic conditions, investor sentiment, and market trends. These fluctuations can distort the true value of a company's assets and liabilities, making it difficult for management to make accurate and reliable decisions about capital investments. On the other hand, book values are based on historical cost and are not affected by market fluctuations, making them a more stable and reliable source of data for financial analysis and decision-making.

B is incorrect. The statement that lenders and rating agencies use book values in their calculations is also true, and this is another reason why companies might prefer to use book values instead of market values in their capital structure targets. Lenders and rating agencies rely on book values to assess a company's creditworthiness and financial stability. They use this information to determine the company's ability to repay its debts and to evaluate the risk associated with lending to the company. If a company were to use market values, which are subject to fluctuations, it could potentially misrepresent its financial position and mislead lenders and rating agencies. Therefore, the use of book values in capital structure targets is beneficial for both the company and its stakeholders.

CFA Level 1, Topic 5 – Corporate Issuers, Learning Module 6 – Capital Structure, LOS 6d: Describe optimal and target capital structures.

Q.36 Leopold Bank is currently trading at $53 after declaring a dividend of $3.10 per share for next year with an expected growth of 5%. If the investors' required rate of return is 11%, Leopold Bank is *most likely*:

      A. overvalued.

      B. fairly priced.

      C. undervalued.

The intrinsic value of a security is the value that investors would assign to it if they had a complete understanding of its investment characteristics. This intrinsic value can be estimated using the Gordon Growth Model, which is a model used to determine the intrinsic value of a stock based on a future series of dividends that grow at a constant rate. The formula for this model is:

$$P_0 = \frac{D_1}{(r - g)}$$

where P0 is the price of the stock, D1 is the dividend expected next year, r is the required rate of return, and g is the growth rate.

Applying the given values to this formula, we get:

$$P_0 = \frac{3.1}{0.11 - 0.05} = 51.67$$

This calculated intrinsic value of $51.67 is less than the current market price of $53. When the market price of a security is higher than its intrinsic value, it is considered overvalued. Hence, Leopold Bank's stock is overvalued.

CFA Level 1, Topic 5 –Equity, Learning Module 8 – Equity Valuation: Concepts and Basic Tools, LOS 8a: Evaluate whether security, given its current market price and a value estimate, is overvalued, fairly valued, or undervalued by the market

Q.37 Turkish Gold is planning a new project. The cost to build the new mine is $1.1 million (paid at the end of the first year) and the mine should bring cash inflows of $510,000 over the next four years (year 2 to 5). The cost to close down the mine over the following year is going to be $220,000. The minimum price for this land if Turkish Gold wishes to sell it now, given a 12% required rate of return is *closest to:*

    A. $289,477

    B. $324,214

    C. $400,936

The NPV is a measure of the profitability of a project and is calculated by discounting the cash inflows and outflows at the required rate of return. In this case, the required rate of return is 12%.

The cash flows for the project are as follows: an initial outflow of $1.1 million at the end of the first year for building the mine, followed by inflows of $510,000 each year for the next four years (years 2 to 5), and finally an outflow of $220,000 at the end of the sixth year for closing down the mine. Each of these cash flows is discounted at the rate of 12% to obtain their present values. The sum of these present values gives the NPV of the project, which is $289,477. This is the minimum price at which Turkish Gold should be willing to sell the land now.

B is incorrect. The value of $324,214 seems to have been obtained by incorrectly assuming that the cost of building the mine was incurred at the start of the project, rather than at the end of the first year as specified in the question. This would result in a higher present value of the initial outflow, and hence a higher NPV. However, this is not consistent with the information provided in the question.

C is incorrect. The value of $400,936 appears to have been obtained by neglecting the final cash outflow of $220,000 for closing down the mine. This would result in a higher NPV, as the total cash outflows would be lower. However, this is not consistent with the information provided in the question, which clearly states that there is a cost associated with closing down the mine.

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.38 Which of these is *least likely* a secondary source of liquidity?

     A. Filing for bankruptcy.

     B. Secondary equity offering.

     C. Renegotiating debt contracts.

The secondary equity offering is not typically considered a secondary source of liquidity for a company. In a secondary equity offering, existing shareholders sell their shares to the public. The proceeds from this sale go to the shareholders who sold their shares, not to the company. Therefore, while a secondary equity offering can provide liquidity to shareholders, it does not provide liquidity to the company itself. This is in contrast to other methods of raising funds, such as issuing new shares or borrowing money, which do provide liquidity directly to the company.

A is incorrect. Filing for bankruptcy is indeed a secondary source of liquidity. When a company files for bankruptcy, it is essentially declaring that it cannot meet its debt obligations. This can lead to a restructuring of the company's debts, which can free up cash flow and provide liquidity. Additionally, in a bankruptcy, a company's assets may be sold off to pay creditors, which can also provide a source of liquidity. Therefore, while bankruptcy is a drastic measure and has many negative consequences, it is a method by which a company can obtain liquidity.

C is incorrect. Renegotiating debt contracts is also a secondary source of liquidity. When a company renegotiates its debt contracts, it can potentially lower its interest payments, extend the maturity of its debts, or convert debt to equity. All of these actions can free up cash flow and provide liquidity to the company. Therefore, renegotiating debt contracts is a method by which a company can improve its liquidity position.

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

Q.39 In which of the following bond-issuing mechanisms does an investment bank have the highest risk?

    A. Auction.

    B. Best effort offering.

    C. Underwritten offering.

The highest risk for an investment bank in bond-issuing mechanisms is in an underwritten offering. In an underwritten offering, the investment bank purchases the bonds from the issuing firm at a predetermined price. The bank then attempts to sell these bonds to the public at a higher price, aiming to make a profit. The risk lies in the fact that the investment bank retains any unsold bonds. If the bank is unable to sell the bonds at a higher price, or worse, unable to sell them at all, it stands to lose the difference between the purchase price and the selling price, or even the entire investment in the worst-case scenario. This risk is significantly higher than in other bond-issuing mechanisms.

A is incorrect. In an auction, the investment bank does not bear any risk. An auction involves inviting the public to place bids on the bonds, with the highest bid winning the bond. The investment bank does not purchase the bonds, and therefore does not risk losing money if the bonds are not sold. The bank merely facilitates the auction process, and the risk of unsold bonds lies with the issuing firm, not the bank.

B is incorrect. In a best efforts offering, the investment bank also does not bear any risk. The bank acts as a broker in this case, earning a commission for facilitating the sale of the bonds. The issuing firm retains all the risks associated with the sale of the bonds. If the bonds are not sold, the investment bank does not lose any money, as it has not purchased the bonds. The risk of unsold bonds and the potential loss from the difference between the purchase price and the selling price lies solely with the issuing firm.

Therefore, in comparison to an auction and a best efforts offering, an underwritten offering presents the highest risk to an investment bank. The bank guarantees the sale of the bonds at the offering price and agrees to take up any unsold amount, thereby assuming a higher risk.

CFA Level 1, Topic 6 – Fixed Income, Learning Module 3 – Fixed-Income Issuance and Trading, LOS 3c: Compare primary and secondary fixed-income markets to equity markets

Q.40 A U.S-based firm has a position in a European bond with a par value of €50 million. For a 1 basis point increase in yield, the market value of the investment changes to €57.85 million, and for a 1 basis point decrease in yield, the investment value changes to €58.75 million. The price value of basis point for the investment is *closest to*:

    A. 0.016

    B. 0.097

    C. 0.450

The PVBP is a measure that estimates the change in the full price of an investment given a one basis point change in the yield to maturity. This is a crucial concept in bond pricing as it helps investors understand the sensitivity of the bond price to changes in the yield. In this case, the PVBP is calculated using the formula:

$$\text{PVBP} = \frac{(\text{PV}_-) - (\text{PV}_+)}{2}$$

Where PV- and PV+ represent the bond prices calculated after increasing and decreasing the yield to maturity by one basis point respectively. Substituting the given values into the formula, we get:

$$\text{PVBP} = \frac{(58.75 - 57.85)}{2} = 0.450$$

A is incorrect. This option suggests that the PVBP for the investment is 0.016. However, as we have calculated above, the actual PVBP is 0.450. The discrepancy could be due to a miscalculation or misunderstanding of the concept of PVBP. It's important to note that the PVBP is a measure of the change in the full price of an investment for a one basis point change in yield, and not the change in yield itself. Therefore, a PVBP of 0.016 would imply a much smaller change in the full price for a one basis point change in yield, which is not consistent with the given information.

B is incorrect. This option suggests that the PVBP for the investment is 0.097. Again, this is not consistent with our calculation, which shows that the actual PVBP is 0.450. A PVBP of 0.097 would imply a smaller change in the full price for a one basis point change in yield, which is not consistent with the given information. This discrepancy could be due to a miscalculation or misunderstanding of the concept of PVBP. It's crucial to understand that the PVBP is a measure of the sensitivity of the bond price to changes in the yield, and not the change in yield itself.

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.41 Suzanne Jennings purchased Bond A with a coupon payment per period of 4% for 4 years at a price of $106. The bond is *most likely* trading at:

    A. par value.

    B. a premium.

    C. a discount.

The coupon rate of the bond, which is 4%, is greater than the market discount rate. The market discount rate is calculated using the formula for the yield to maturity of a bond, which takes into account the present value (PV), future value (FV), payment (PMT), and number of periods (N). In this case, the values are as follows: N = 4 years, PV = -$106, PMT = 4, and FV = $100. When these values are plugged into the formula, the calculated market discount rate is 2.41%, which is less than the coupon rate of 4%. Therefore, the bond is priced at a premium above its par value.

A is incorrect. This option suggests that the bond is trading at its par value. A bond trades at par value when the coupon rate is equal to the market discount rate. However, in this case, the coupon rate of 4% is greater than the market discount rate of 2.41%. Therefore, the bond is not trading at par value, but at a premium. This discrepancy between the coupon rate and the market discount rate is what leads to the bond being priced above its par value.

C is incorrect. This option suggests that the bond is trading at a discount. A bond trades at a discount when the coupon rate is less than the market discount rate. However, in this case, the coupon rate of 4% is greater than the market discount rate of 2.41%. Therefore, the bond is not trading at a discount, but at a premium. This discrepancy between the coupon rate and the market discount rate is what leads to the bond being priced above its par value.

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

Q.42 All else being equal, which of these is *most likely* to have a lower yield?

      A. 2-year bond.

      B. 5-year bond.

      C. 10-year bond.

Option A, the 2-year bond, is most likely to have a lower yield. This is primarily due to the concept of interest rate risk, which is the risk that arises for bond owners from fluctuating interest rates. How much interest rate risk a bond has depends on how sensitive its price is to interest rate changes in the market. The sensitivity depends on two things: the bond's time to maturity, and the coupon rate of the bond. With longer maturities, bonds become more sensitive to changes in interest rates, causing their prices to fluctuate more. This is known as price risk. On the other hand, bonds that have shorter maturities have less price risk and, therefore, less interest rate risk. Hence, investors require less yield for short-term bonds compared to long-term bonds. Therefore, a 2-year bond will have a lower yield compared to a 5-year or 10-year bond, all else being equal.

B is incorrect. The statement that bonds with a lower yield have a shorter period is not entirely accurate. While it is true that bonds with shorter maturities generally have lower yields, this is not a rule. The yield of a bond is determined by a variety of factors, including the credit quality of the issuer, the length of time until expiration, and the coupon rate. Therefore, it is not accurate to say that a bond with a lower yield will always have a shorter period. In this case, a 5-year bond will have a higher yield than a 2-year bond because it carries a higher interest rate risk.

C is incorrect. While it is true that a 10-year bond will offer investors the highest yield among the bonds given, this is because they are taking on more interest rate risk. The yield is not inherently higher because of the bond's longer maturity. Instead, the higher yield is a compensation for the increased risk associated with a longer-term bond. Therefore, while a 10-year bond will have a higher yield than a 2-year bond, it is not because the bond is inherently more valuable, but because it carries a higher level of risk.

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

Q.43 Should an investor buy a 10-year bond priced at $1,085 with a 10% semi-annual coupon if the comparable bond yield is 9%?

      A. No, the bond is undervalued by $20.

      B. No, the bond is overvalued by $20.

      C. Yes, the bond is undervalued by $20.

W need to calculate the present value of the bond using the given information. The number of periods (N) is 20 because the bond is a 10-year bond with semi-annual coupons. The interest rate (I) is 4.5%, which is half of the comparable bond yield of 9%. The payment (PMT) is $50, which is 10% of the face value of the bond divided by 2 because the coupon is semi-annual. The future value (FV) is $1,000, which is the face value of the bond. Using these values, we can calculate the present value (PV) of the bond, which comes out to be $1,065.

Now, if we compare the calculated present value of the bond with its market price, we find that the market price of the bond is $1,085, which is $20 more than its present value. This means that the bond is overvalued by $20. Therefore, an investor should not buy this bond because they would be paying more than what the bond is actually worth.

CFA Level 1, Topic 6 –Equity, Learning Module 8 – Equity Valuation: Concepts and Basic Tools, LOS 8a: Evaluate whether security, given its current market price and a value estimate, is overvalued, fairly valued, or undervalued by the market.

Q.44 Which of the following is *most likely* correct regarding true and street convention yield? The true yield is:

    A. always equal to the street convention yield.

    B. never less than the street convention yield.

    C. never higher than the street convention yield.

The true yield-to-maturity is calculated using the actual calendar of weekends and bank holidays, which delays the time to pay.
Whenever the payment day falls on a weekend or holiday; payment is pushed to the next business day after the holiday or weekend. As a result, the true yield is always lower than the street convention yield. However, the difference between the true and street convention yield is always very small, perhaps 0.01% or less.

A is incorrect. The true yield is not always equal to the street convention yield. It can be equal if the payment date does not fall on a weekend or holiday. The true yield will be lower than the street convention yield when the payment date falls on a weekend or a holiday.

B is incorrect. The street convention yield does not include weekends and holidays. It assumes that payments are made on scheduled dates.

Therefore, the street convention yield value can never be less than the true yield.

CFA Level I, Topic 6, Fixed Income, Learning Module 7: Yield and Yield Spread Measures for Fixed-Rate Bonds, LOS 7a: Calculate annual yield on a bond for varying compounding periods in a year.

Q.45 Which of the following is the highest ranked debt?

    A. First lien loan.

    B. Senior unsecured.

    C. Senior subordinated.

In the hierarchy of debt obligations, the first lien loan is considered the highest-ranked or most senior debt. This means that in the event of a default, the first lien loan has the first claim on the assets of the debtor. This is a crucial aspect of finance as it determines the order of payment in case of insolvency or bankruptcy.

The concept of seniority ranking in debts is an important one in finance. It essentially determines the order in which debts are to be paid off in the event of a default. The ranking is as follows:

1. First-lien loan – Senior secured
2. Second lien loan – Secured
3. Senior unsecured
4. Senior subordinated
5. Subordinated
6. Junior subordinated

As can be seen from the above list, the first-lien loan is at the top of the hierarchy, making it the highest-ranked debt.

B is incorrect. The senior unsecured loan is not the highest-ranked debt. It is ranked third in the hierarchy, below the first lien and second lien loans. This means that in the event of a default, the senior unsecured loan would only be paid after the first and second lien loans have been paid off. This makes it less secure and lower-ranked than the first lien loan.

C is incorrect. The senior subordinated loan is also not the highest-ranked debt. It is ranked fourth in the hierarchy, below the first lien, second lien, and senior unsecured loans. This means that in the event of a default, the senior subordinated loan would only be paid after the first lien, second lien, and senior unsecured loans have been paid off. This makes it even less secure and lower-ranked than the senior unsecured loan, and certainly lower than the first lien loan.

CFA Level 1, 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.46 All else being equal, a callable bond is more beneficial to the:

    A. issuer

    B. investor.

    C. neither the investor nor the issuer.

Callable bonds provide the issuer with the right, but not the obligation, to redeem the bond before its maturity. This feature serves as a protective measure against potential declines in interest rates. If interest rates decrease, the issuer can choose to call back the bond, effectively replacing an old, high-interest bond with a new, lower-interest one. This ability to adjust to changing market conditions provides a significant advantage to the issuer. However, from the investor's perspective, this feature introduces a higher level of reinvestment risk. This is because if the bond is called back, the investor may have to reinvest the returned capital at a lower interest rate. To compensate for this risk, callable bonds usually offer a higher yield than non-callable bonds.

B is incorrect. While it might seem that a callable bond could be beneficial to the investor due to the typically higher yield, the potential disadvantages outweigh this benefit. The primary disadvantage is the reinvestment risk introduced by the callable feature. If the issuer decides to call back the bond, the investor is left with capital that they must reinvest, potentially at a lower interest rate. This risk is particularly significant in a declining interest rate environment. Furthermore, the investor has no control over whether the bond is called back, which adds an element of uncertainty to their investment.

C is incorrect. The assertion that a callable bond is neither beneficial to the investor nor the issuer is incorrect. As explained above, the issuer stands to benefit significantly from the callable feature of the bond. They gain the flexibility to adjust to changing market conditions and protect themselves against declines in interest rates. On the other hand, while the investor faces increased reinvestment risk, they are typically compensated with a higher yield. Therefore, it is not accurate to say that a callable bond is not beneficial to either party.

CFA Level 1, Topic 6 – Equity, 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.47 The current price of a bond is $1054.When the yield-to-maturity (YTM) increases by 1%, the price of the bond goes down to $1023.When the yield-to-maturity (YTM) decreases by 1%, the price of the bond reaches $1084.The modified duration of the bond is *closest to:*

    A. 0.35

    B. 5.78

    C. 2.89

The formula for the approximate modified duration of a bond, which measures the sensitivity of

the bond's price to changes in its yield-to-maturity (YTM), is as follows:

$$\text{Approximate Modified Duration} = \frac{PV_- - PV_+}{2 \times \Delta \text{Yield} \times PV_0}$$

Where:

- PV_- = the price of the bond when the yield is decreased,

- PV_+ = the price of the bond when the yield is increased,

- PV_0 = the initial price of the bond,

- ΔYield = the change in yield (as a decimal).

In this case:

- PV_- = \$1084 (the price when the yield decreases by 1%),

- PV_+ = \$1023 (the price when the yield increases by 1%),

- PV_0 = \$1054 (the initial price of the bond),

- ΔYield = 1% or 0.01.

Substituting these values into the formula:

$$\text{Approximate Modified Duration} = \frac{1084 - 1023}{2 \times 0.01 \times 1054}$$

First, calculate the numerator:

$$1084 - 1023 = 61$$

Now calculate the denominator:

$$2 \times 0.01 \times 1054 = 21.08$$

Therefore, the approximate modified duration is:

$$\text{Approximate Modified Duration} = \frac{61}{21.08} \approx 2.89$$

CFA Level 1, Topic 6 – Fixed-Income, Learning Module 11 – Yield-Based Bond Duration

Q.48 Investor X has an investment horizon of 3 years and has invested in a 4% coupon-paying bond with a YTM of 6%. Investor Y has an investment horizon of 10 years and has invested in a 5% coupon-paying bond with a YTM of 5%.

Which investor *most likely* faces higher market price risk compared to reinvestment risk?

      A. Investor X.

      B. Investor Y.

      C. Both investors have the same market and reinvestment risks.

For investor X, since the bond's coupon rate is below its YTM, Investor X is exposed to **market price risk**. If interest rates rise, the bond's price will fall, leading to capital losses. With a shorter investment horizon, reinvestment risk is less relevant for Investor X.

For investment Y, the bond's coupon rate aligns with its YTM, reducing market price risk. If interest rates change, the bond's price impact will be less severe. With a longer investment horizon, reinvestment risk becomes more significant for Investor Y. The coupons received over 10 years need to be reinvested, and if rates decline, reinvesting at lower rates could lead to lower returns.

CFA Level I, Topic 6, Fixed Income, Learning Module 10: Interest Rate Risk and Return, LOS 10a: calculate and interpret the sources of return from investing in a fixed-rate bond.

Q.49 All else being equal, an investor will *most likely* prefer a bond that is:

    A. less Convex.

    B. more convex.

    C. less or more convex depending on the investor's overall portfolio.

Option B, All else being equal, investors generally prefer bonds with higher convexity. Convexity is a measure of the curvature in the relationship between bond prices and bond yields. It demonstrates how the duration of a bond changes as the interest rate changes. High convexity indicates that the bond price is less affected by interest rate fluctuations, which is beneficial for the investor. When interest rates change, the price of a bond with high convexity will increase more than a bond with low convexity if rates decrease, and will decrease less if rates increase. This characteristic of high convexity bonds provides a certain level of protection to the investor against interest rate risk. Therefore, in a volatile market with fluctuating interest rates, a bond with higher convexity is more desirable for an investor as it reduces their exposure to interest rate risk.

A is incorrect. A bond that is less convex would not be the most preferred choice for an investor, all else being equal. This is because a bond with less convexity is more sensitive to interest rate changes. When interest rates rise, the price of a less convex bond will fall more than a bond with higher convexity. Conversely, when interest rates fall, the price of a less convex bond will rise less than a bond with higher convexity. This increased sensitivity to interest rate changes makes less convex bonds more risky for investors, particularly in a volatile market with fluctuating interest rates.

C is incorrect. While it is true that the preference for bond convexity can depend on the investor's overall portfolio and their risk tolerance, the question specifies that all else is equal. In this context, it is generally accepted that more convex bonds are preferred due to their lower sensitivity to interest rate changes. Therefore, the preference for bond convexity would not depend on the investor's overall portfolio in this scenario.

CFA Level 1, Topic 6 – Fixed Income, Learning Module 12 – Yield-Based Bond Convexity and Portfolio Properties, LOS 12a: Calculate and interpret convexity and describe the convexity adjustment.

Q.50 A bond investor has an investment horizon of 6 years. He recently calculated that the Macaulay duration of his portfolio is 9. The duration gap *closest to*:

    A. 0.67

    B. 1.50

    C. 3.00

The duration gap is a measure of the sensitivity of a bond's price to changes in interest rates. It is calculated as the difference between the Macaulay duration of the bond and the investor's investment horizon. The Macaulay duration is a measure of the weighted average time until a bond's cash flows are received, while the investment horizon is the period over which an investor plans to hold the bond. In this case, the Macaulay duration of the bond portfolio is 9 years, and the investment horizon is 6 years.

By subtracting the investment horizon from the Macaulay duration, we can calculate the duration gap. In this case, the calculation would be as follows: 9 (Macaulay duration) - 6 (investment horizon) = 3. This means that the duration gap is 3 years. This indicates that the bond portfolio is more sensitive to changes in interest rates than the investor's investment horizon. If interest rates were to rise, the value of the bond portfolio would decrease more than if the investor had a shorter investment horizon. Conversely, if interest rates were to fall, the value of the bond portfolio would increase more than if the investor had a shorter investment horizon.

A is incorrect. A duration gap of 0.67 would indicate that the Macaulay duration of the bond portfolio is very close to the investment horizon. This would mean that the bond portfolio is not very sensitive to changes in interest rates. However, in this case, the Macaulay duration is significantly longer than the investment horizon, resulting in a larger duration gap.

B is incorrect. A duration gap of 1.50 would indicate that the Macaulay duration of the bond portfolio is somewhat longer than the investment horizon. This would mean that the bond portfolio is somewhat sensitive to changes in interest rates. However, in this case, the Macaulay duration is significantly longer than the investment horizon, resulting in a larger duration gap.

CFA Level 1, Topic 6 – Fixed Income, Learning Module 10 – Interest Rate Risk and Return, LOS 10b: Describe the relationships among a bond's holding period return, its Macaulay duration, and the investment horizon.

Q.51 A US investor purchases an unsecured bond underwritten by an international syndicate and denominated in Canadian dollars. The type of bond described is *most likely* a:

    A. Eurobond.

    B. foreign bond.

    C. domestic bond.

The key characteristics of a Eurobond make it the most likely type of bond that the US investor has purchased. Eurobonds are typically denominated in a currency other than that of the investor's home country. In this case, the bond is denominated in Canadian dollars, which is not the home currency of the US investor. Furthermore, Eurobonds are usually unsecured, meaning they are not backed by any form of collateral. This is consistent with the description of the bond in the question. Eurobonds are also typically underwritten by an international syndicate, which is a group of investment banks that work together to issue the bonds on behalf of the bond issuer. This is also in line with the description of the bond in the question. Lastly, Eurobonds are often less regulated than other types of bonds, which can make them more attractive to certain types of investors.

B is incorrect. A foreign bond is a bond that is issued in a domestic market by a foreign entity, and it is denominated in the domestic market's currency. This does not match the description of the bond in the question. The bond in the question is denominated in Canadian dollars, which is not the currency of the US investor's domestic market. Furthermore, the bond is underwritten by an international syndicate, not a foreign entity. Therefore, it is unlikely that the bond in question is a foreign bond.

C is incorrect. A domestic bond is a bond that is issued in the country and currency in which it is traded. This does not match the description of the bond in the question. The bond in the question is denominated in Canadian dollars, which is not the currency of the US investor's domestic market. Furthermore, the bond is underwritten by an international syndicate, not a domestic entity. Therefore, it is unlikely that the bond in question is a domestic bond.

CFA Level 1, Topic 6 – Fixed-Income, Learning Module 2 – Fixed-Income Cash Flows and Types, LOS 2b: Describe how legal, regulatory, and tax considerations affect the issuance and trading of fixed-income securities.

Q.52 An 8% coupon rate 5-year bond has a maturity (par) value of $1,000. If the discount rate is 5% and interest is paid semi-annually, then the value of the bond is *closest to*:

    A. $1,129.88.

    B. $1,131.28.

    C. $1,481.36.

TThis is calculated using a financial calculator with the following inputs: N = 5 × 2 = 10, which represents the number of periods (5 years times 2 to account for semi-annual payments); FV = 1,000, which is the future value or the maturity (par) value of the bond; PMT = (8%/2) × 1,000 = 40, which is the payment or the semi-annual coupon payment (8% annual coupon rate divided by 2 to account for semi-annual payments, times the par value of the bond); and I/Y = 2.5%, which is the discount rate (5% annual discount rate divided by 2 to account for semi-annual compounding). Using these inputs, the present value (PV) of the bond is computed to be $1,131.28.

A is incorrect. The value of $1,129.88 would have been the bond's present value if the bond were to be paying interest annually and not semi-annually. This is because when interest is paid annually, there are fewer compounding periods and thus the present value of the bond is slightly lower. However, in this case, the bond pays interest semi-annually, which means there are more compounding periods and thus the present value of the bond is slightly higher.

C is incorrect. The value of $1,481.36 has been incorrectly obtained by failing to consider that the coupons are paid semi-annually. This is a common mistake when calculating the present value of a bond. If the coupons were paid annually, the present value of the bond would be lower because there would be fewer compounding periods. However, in this case, the bond pays interest semi-annually, which means there are more compounding periods and thus the present value of the bond is higher. Therefore, the value of $1,481.36 is incorrect because it does not accurately reflect the semi-annual coupon payments of the bond.

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 ABC Corp has issued many types of debt over the past couple of years. The rating on their debt is A-. Rating agencies have chosen this rating based on:

    A. A pro-rata basis.

    B. The latest debt issued.

    C. The senior unsecured debt.

Rating agencies, when determining the credit rating of a corporation like ABC Corp, primarily focus on the senior unsecured debt. This is because senior unsecured debt is considered the most reliable indicator of a company's overall creditworthiness. Senior unsecured debt is a type of debt that is not secured by any collateral and has a priority claim in the event of a company's liquidation. It is considered 'senior' because in the event of bankruptcy, senior debt is paid out first before other types of debt. Therefore, the credit rating of this type of debt is a reflection of the company's ability to meet its financial obligations and its overall financial health. This is why option C is the correct answer.

A is incorrect. A pro-rata basis refers to a method of assigning an amount to a fraction, according to its share of the whole. While this method might be used in some financial calculations, it is not applicable to credit ratings. Credit ratings are not determined by dividing the company's total debt into equal parts and rating each part separately. Instead, they are based on a comprehensive analysis of the company's overall financial health, with a particular focus on senior unsecured debt.

B is incorrect. While the latest debt issued can have an impact on the company's overall credit rating, it is not the sole or primary factor considered by rating agencies. The agencies look at a multitude of factors, including the company's earnings, cash flow, assets, and liabilities, as well as the nature and seniority of its debt. Therefore, the latest debt issued is just one piece of the puzzle and does not determine the credit rating on its own.

CFA Level 1, Topic 6 – Fixed Income, Learning Module 14 – Credit Risk, LOS 14b: Describe the uses of ratings from credit rating agencies and their limitations.

Q.54 The following forward rates were calculated from a yield curve:

0y1y	0.2%
1y1y	0.4%
2y1y	0.7%
3y1y	0.9%
4y1y	1.3%
5y1y	1.8%

The five-year spot rate is *closest to*:

A. 0.70%.

B. 0.88%.

C. 1.06%.

A forward rate indicates the interest rate on a loan beginning at some time in the future, whereas a spot rate is the interest rate on a loan beginning immediately. Forward rates on bonds or money market instruments are traded in forwarding markets. The forward rates given in the question are used to calculate the five-year spot rate.

The calculation is done by taking the geometric mean of the given forward rates, subtracting 1, and then converting the result into a percentage. The formula used is:

$$\text{spot}_5 = \sqrt[5]{1.002 * 1.004 * 1.007 * 1.009 * 1.013} - 1 = 0.00699 = 0.699\%$$

.

CCFA Level 1, Topic 6 – Fixed-Income, Learning Module 9, The Term Structure of Interest Rates: Spot, Par, and Forward Curves, LOS 9b: Define par and forward rates, and calculate par rates, forward rates from spot rates, spot rates from forward rates, and the price of a bond using forward rates.

Q.55 Which party in the securitization process is primarily responsible for the administration of the loans, including collection of payments and management of loan defaulters?

    A. Seller/Originator.

    B. Special Purpose Entity (SPE).

    C. Servicer.

In the securitization process, the party primarily responsible for the administration of the loans, including collection of payments and management of loan defaulters, is the Servicer. This is because the Servicer's role is to manage the day-to-day operations of the loans. They are the ones who interact directly with the borrowers, collecting payments, managing any issues related to the loans, and dealing with defaulters. They are the ones who ensure that the loans are being serviced properly and that the payments are being collected and distributed to the investors. This is a critical role in the securitization process as it ensures the smooth functioning of the loan process and the protection of the investors' interests.

A is incorrect. The Seller/Originator's role in the securitization process is not primarily about the administration of the loans. Instead, their main role is to grant loans to borrowers and then sell these loans to the Special Purpose Entity (SPE). They are the ones who originate the loans, hence the name, but once the loans are sold to the SPE, they are not typically involved in the day-to-day management of the loans. Their focus is more on the origination and selling of the loans, not on their administration.

B is incorrect. The Special Purpose Entity (SPE) is a separate legal entity created specifically for the securitization process. Its main role is to hold the loans and issue the securities that are backed by these loans. While the SPE plays a crucial role in the securitization process, it does not typically handle the administrative duties associated with the loans. These duties, including the collection of payments and the management of loan defaulters, are handled by the Servicer. The SPE's role is more about the legal and financial structuring of the securitization process, not the administration of the loans.

CFA Level I,Topic 6, Fixed Income, Learning Module 17: Fixed-Income Securitization, LOS 17b: Describe securitization, including the parties and the roles they play.

Q.56 A putable bond is a bond that gives:

    A. the issuer the right to redeem all or part of the bond before the maturity date.

    B. the bondholder the right to exchange the bond for a specific number of common shares.

    C. the bondholder the right to sell the bond back to the issuer at a predetermined price before maturity.

Putable bonds are a type of bond that includes an embedded option for the bondholder. This option allows the bondholder to "put" or sell the bond back to the issuer before its maturity date, at a predetermined price. This feature provides a safety net for bondholders in the event of a rise in interest rates. If interest rates increase, bondholders can choose to sell the bond back to the issuer and then reinvest the proceeds in new bonds that offer higher yields. This is why the price of a putable bond is typically higher than that of a regular bond, as it offers additional flexibility and protection to the bondholder.

A is incorrect. This option suggests that a putable bond gives the issuer the right to redeem all or part of the bond before the maturity date. However, this is a characteristic of a callable bond, not a putable bond. In a callable bond, the issuer has the right, but not the obligation, to redeem the bond before its maturity date. This feature benefits the issuer, as it allows them to reduce their interest costs if rates fall after the bond is issued. However, it introduces additional risk for the bondholder, which is why callable bonds typically have a lower price than regular bonds.

B is incorrect. This option suggests that a putable bond gives the bondholder the right to exchange the bond for a specific number of common shares. However, this is a characteristic of a convertible bond, not a putable bond. Convertible bonds are a type of hybrid security that have both debt and equity characteristics. They give the bondholder the right, but not the obligation, to convert their bond into a predetermined number of the issuer's common shares. This feature provides potential upside for the bondholder if the issuer's share price increases, but it also introduces additional risk, as the bondholder may end up with shares that are worth less than the bond's face value.

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.57 All else being equal, the bond exposed to the greatest level of reinvestment risk is the one selling at:

    A. par.

    B. a discount.

    C. a premium.

TA bond selling at a premium has a higher coupon rate. The coupon rate is the interest rate that the bond issuer pays to the bondholder. When a bond sells at a premium, it means that its coupon rate is higher than the prevailing market interest rates. As a result, the bondholder receives more interest income, which needs to be reinvested. The risk here is that the interest rates may fall in the future, and the bondholder may not be able to reinvest the interest income at the same high rate. This is known as reinvestment risk. Therefore, bonds with higher coupon rates, such as those selling at a premium, face higher reinvestment risks.

A is incorrect. A bond selling at par has a coupon rate that is equal to the prevailing market interest rates. This means that the bondholder receives an interest income that is in line with the market rates. Therefore, the reinvestment risk is lower because the bondholder can likely reinvest the interest income at a similar rate. Compared to a bond selling at a premium, a bond selling at par has a lower reinvestment risk because the coupon rate is not higher than the market rates.

B is incorrect. A bond selling at a discount has a lower coupon rate. This means that the bondholder receives less interest income, which needs to be reinvested. The reinvestment risk is lower because the bondholder receives less interest income to reinvest. Even if the interest rates fall in the future, the impact on the bondholder is less because the amount of interest income to be reinvested is less. Therefore, bonds with lower coupon rates, such as those selling at a discount, face lower reinvestment risks.

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.58 A corporation issues a bond with a covenant that restricts the sale of significant assets without the approval of bondholders. Which type of covenant does this *most likely* define?

      A. Pari passu clause.

      B. Negative Covenant.

      C. Cross-default Clause.

A negative covenant is a type of agreement that is embedded within a bond's indenture. This agreement restricts or even prohibits certain actions by the issuer unless the bondholders give their approval. The covenant that restricts the sale of significant assets without the approval of bondholders is a prime example of a negative covenant.

Negative covenants are designed with the primary aim of protecting the interests of the bondholders. They achieve this by preserving the company's assets and financial stability. This, in turn, ensures that the issuer is capable of meeting its debt obligations. The covenant is designed to prevent the issuer from potentially compromising its financial position and the collateral value backing the bond. If this were to happen, it could adversely affect the bondholders.

A is incorrect. The Pari passu clause is not the correct answer because it is related to the equal treatment of all parties in the same class of debt. This clause ensures that no single creditor receives preferential treatment over others. It is typically involved in the ranking of debts and does not directly relate to the restrictions on the sale of assets or other specific actions by the issuer. Therefore, it does not fit the description of a covenant that restricts the sale of significant assets without the approval of bondholders.

C is incorrect. The Cross-default Clause is also not the correct answer. This clause is a provision that triggers a default on a bond if the issuer defaults on another financial obligation. It is designed to protect bondholders by providing an early warning mechanism and additional security in case the issuer faces financial difficulties. However, it is not directly related to the restrictions on the issuer's actions, such as the sale of significant assets. Instead, it focuses on the issuer's performance on its broader financial obligations. Therefore, it does not fit the description of a covenant that restricts the sale of significant assets without the approval of bondholders.

CFA Level I, 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.59 The intrinsic value of an option is always zero:

    A. at the expiration date.

    B. when the option is out of the money.

    C. when the value of the underlying asset is 0.

The intrinsic value of an option is the difference between the market price of the underlying asset and the strike price of the option. If an option is out of the money, it means that the strike price of a call option is higher than the market price of the underlying asset, or the strike price of a put option is lower than the market price of the underlying asset. In either case, the intrinsic value of the option would be zero because the option holder would choose not to exercise the option to avoid incurring a loss. This is represented mathematically as max (0, St-X) for a call option and max (0, X-St) for a put option, where X is the strike price and St is the price of the underlying asset at expiration.

A is incorrect. This option suggests that the intrinsic value of an option is always zero at the expiration date. However, this is not always the case. The intrinsic value of an option at expiration depends on the market price of the underlying asset at that time. If the market price is higher than the strike price for a call option, or lower than the strike price for a put option, the intrinsic value of the option would be positive. Conversely, if the market price is lower than the strike price for a call option, or higher than the strike price for a put option, the intrinsic value of the option would be zero. Therefore, the intrinsic value of an option at expiration is not always zero, but depends on the relationship between the market price of the underlying asset and the strike price of the option.

C is incorrect. This option suggests that the intrinsic value of an option is always zero when the value of the underlying asset is zero. However, this is not necessarily true. The intrinsic value of an option is the difference between the market price of the underlying asset and the strike price of the option. If the value of the underlying asset is zero, the intrinsic value of a call option would be negative, as the strike price would be higher than the market price. However, the intrinsic value of a put option would be positive, as the strike price would be lower than the market price. Therefore, the intrinsic value of an option is not always zero when the value of the underlying asset is zero, but depends on the type of option and the strike price.

CFA Level 1, Topic 7 – Derivatives, Learning Module 8– Pricing and Valuation of Options, LOS 8a: Explain the exercise value, moneyness, and time value of an option.

Q.60 Sonia Bass works as a hedge fund manager at High-Yield Investments (HYIN). While talking to a colleague, Bass posed the following question: "How do the standardization of derivative investments and the presence of designated market makers help the trade of such securities?" The best answer to Bass' question is that they:

      A. guarantee the buying and selling of a derivative.

      B. increase liquidity and reduce the cost of liquidity.

      C. guarantee the price at which a derivative is traded.

While standardization and the presence of designated market makers do improve the efficiency and liquidity of the derivatives market, they do not guarantee the buying and selling of a derivative. Market conditions, such as lack of demand or excessive supply, can still make it challenging to execute trades, even in a standardized market with market makers. The primary role of market makers is to provide liquidity, not to guarantee transactions.

Although designated market makers help provide more predictable pricing by quoting buy and sell prices, they do not guarantee the price at which a derivative is traded. Market prices can fluctuate significantly due to changes in the underlying asset's value, market sentiment, or macroeconomic factors. Traders may still face slippage, which is the difference between the expected price of a trade and the price at which the trade is executed, especially in volatile market conditions.

CFA Level I, Topic 8, Derivatives, Learning Module 1: Derivative Instrument and Derivative Market Features, LOS 1b: Describe the basic features of derivative markets, and contrast over-the-counter and exchange-traded derivative markets.

Q.61 Tiara Enterprises (TIEN) has just announced its plans to establish a facility in New York, USA, to meet the increased demand for its products. TIEN plans to fund the expansion with debt and in order to hedge the risk of borrowing, TIEN has entered into a plain vanilla interest rate swap with a notional principal of $50 million. TIEN would make semiannual payments at the rate of 12% with the counterparty making floating rate payments at the Euribor rate. Assuming a 360-day year, if the Euribor was 13.5% on the last settlement date and is 11.0% on the current settlement date, the amount that TIEN would receive on the current settlement date is *closest to*:

    A. $250,000.

    B. $375,000.

    C. $3,375,000.

TIEN's payment:

$$(\$50 \text{ million}) \times (\frac{180}{360}) \times (12\%) = \$3,000,000$$

Counterparty's payment:

$$(\$50 \text{ million}) \times (\frac{180}{360}) \times (0.135) = \$3,375,000$$

Therefore, TIEN would receive a net amount of $375,000.

Note that the amount payable under the floating leg of the swap is based on the interest rate at time **t-1**.

A is incorrect. It suggests TIEN would receive $250,000, which does not align with the corrected calculations based on the current Euribor rate.

C is incorrect. It vastly overestimates the amount TIEN would receive, not aligning with the calculations based on the given interest rates and the terms of the swap.

CFA Level I, Topic 7, Derivatives, Learning Module 7: Pricing and Valuation of Interest Rate and Other Swaps, LOS 7b: Contrast the value and price of swaps.

Q.62 Over-the-counter options are:

A. listed on the NYSE.

B. exposed to default risk.

C. standardized transactions.

OTC options are contracts that are traded directly between two parties, without going through an exchange or other intermediary. This means that there is no central authority or organization that guarantees the performance of the contract. If one party fails to fulfill their obligations under the contract, the other party is exposed to the risk of default. This is a significant risk that is inherent in OTC options, and it is one of the key differences between OTC options and exchange-traded options, which are backed by clearing houses that guarantee the performance of the contracts.

A is incorrect. The statement that OTC options are listed on the New York Stock Exchange (NYSE) is incorrect. The NYSE is a centralized exchange where securities are listed and traded. OTC options, on the other hand, are not listed on any exchange. Instead, they are traded directly between two parties. This is a key characteristic of OTC options, and it is one of the factors that contributes to their flexibility and customization potential. However, it also means that they are not subject to the same level of regulation and oversight as securities that are listed on an exchange, which can increase their risk.

C is incorrect. The assertion that OTC options are standardized transactions is incorrect. One of the defining characteristics of OTC options is that they can be customized to meet the specific needs and preferences of the parties involved. This is in contrast to exchange-traded options, which are standardized contracts with fixed terms and conditions. The ability to customize OTC options can be advantageous in certain situations, as it allows parties to tailor the contract to their specific risk tolerance, investment objectives, and other factors. However, it also adds complexity and can increase the risk of the contract.

CFA Level 1, Topic 7 – Derivatives, Learning Module 1 – Derivative Instrument and Derivative Market Features, LOS 1b: Describe the basic features of derivative markets, and contrast over-the-counter and exchange-traded derivative markets.

Q.63 An investor would face the greatest default risk by buying:

   A. A cash-settled forward contract.

   B. A cash-settled futures contract on a highly volatile commodity.

   C. A future commodity contract with a physical delivery clause.

Forward contracts are traded in Over-The-Counter (OTC) markets. In these markets, derivatives are traded directly between two parties without the involvement of an exchange. This direct trading exposes the parties to a significant amount of counterparty or default risk. Default risk arises when one party fails to fulfill their part of the agreement, leaving the other party at a loss. In the case of a forward contract, if the party obligated to sell the underlying asset fails to do so, or if the party obligated to buy the asset fails to provide the necessary funds, the other party faces the risk of default. This risk is greatest in OTC markets where there is no central authority to enforce the contract terms.

B is incorrect. A cash-settled futures contract on a highly volatile commodity does indeed carry a high level of risk due to the volatility of the underlying commodity. However, this risk is not default risk. Futures contracts are traded on exchanges, which act as the counterparty for each transaction. This means that the exchange assumes the risk of default, not the individual parties to the contract. Therefore, while a futures contract on a highly volatile commodity does carry risk, it is not the greatest source of default risk for an investor.

C is incorrect. A future commodity contract with a physical delivery clause does carry some risk, particularly if the buyer lacks the facilities to store the commodity or the seller lacks the means to deliver it. However, like all futures contracts, these contracts are traded on exchanges, which act as the counterparty for each transaction. This means that the exchange assumes the risk of default, not the individual parties to the contract. Therefore, while a future commodity contract with a physical delivery clause does carry risk, it is not the greatest source of default risk for an investor.

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

Q.64 Which derivative contract among the following is *most effective* in mitigating exposure to a potential decrease in a company's stock price over the next three months?

      A. a long call position on the company's stock settling in three months

      B. a short put position on the company's stock settling in three months

      C. a short futures position on the company's stock settling in three months

A short futures position on the company's stock settling in three months is the most effective derivative contract in mitigating exposure to a potential decrease in a company's stock price. This is because a short futures position allows an investor to sell the company's stock at a predetermined price in the future. If the stock price decreases, the investor can buy the stock at the lower market price and sell it at the higher futures price, thus mitigating the loss from the decrease in the stock price. The futures contract, being an exchange-traded derivative, adheres to standardized terms established by the exchange and necessitates an initial margin and daily settlement. This ensures the investor's ability to execute the contract regardless of the market conditions.

A is incorrect. A long call position on the company's stock settling in three months would give the investor the right, but not the obligation, to buy the company's stock at a predetermined price. This strategy is typically used when an investor anticipates an increase in the stock price, not a decrease. If the stock price decreases, the investor would not exercise the option and would lose the premium paid for the call option. Therefore, a long call position would not be effective in mitigating exposure to a potential decrease in the company's stock price.

B is incorrect. A short put position on the company's stock settling in three months would obligate the investor to buy the company's stock at a predetermined price if the put option is exercised. This strategy is typically used when an investor anticipates the stock price to remain stable or increase, not decrease. If the stock price decreases, the put option would likely be exercised, forcing the investor to buy the stock at a higher price than the market price. Therefore, a short put position would increase, rather than mitigate, the investor's exposure to a potential decrease in the company's stock price.

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

Q.65 Which of the following statements is an advantage of investing in hedge funds through a fund of funds? A fund of funds provides:

    A. lower management fees.

    B. an increase in diversification, resulting in risk reduction.

    C. an increase in diversification, resulting in return enhancement.

A fund of funds is a type of investment vehicle that invests in a diverse portfolio of other funds, rather than investing directly in stocks, bonds, or other securities. This strategy is primarily used to increase diversification and reduce risk. The fund of funds achieves this by spreading investments across a variety of funds, each with its own unique investment strategy and asset allocation. This diversification can help to mitigate the impact of any single fund's poor performance on the overall portfolio. This is the primary advantage of investing in hedge funds through a fund of funds.

A is incorrect. One of the main disadvantages of a fund of funds is that it typically charges higher management fees than a single hedge fund. This is because the fund of funds not only charges its own management fee, but also incurs the management fees of the underlying funds in which it invests. These fees can significantly eat into the overall returns of the fund of funds, making it a more expensive investment option.

C is incorrect. While a fund of funds does increase diversification, this does not necessarily result in return enhancement. The performance of a fund of funds is dependent on the performance of the underlying funds in which it invests. While diversification can help to reduce risk, it does not guarantee higher returns. In fact, the high fees charged by a fund of funds can often reduce its net returns.

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

Q.66 Alternative investments, when compared to traditional investments, have higher:

A. Liquidity.

B. Transparency.

C. Management fees.

Alternative investments encompass a wide range of non-traditional assets, including derivatives, real estate, short-selling stocks, commodities, fine art, racing horses, and more. These types of investments are typically more expensive to manage due to their complex nature and the specialized knowledge required to handle them. For instance, managing a real estate portfolio may involve property maintenance, tenant management, and legal considerations, all of which can incur significant costs. Similarly, investing in fine art or racing horses requires a deep understanding of these markets, which often necessitates the hiring of experts in these fields. These factors contribute to the higher management fees associated with alternative investments.

A is incorrect. One of the defining characteristics of alternative investments is their illiquidity. Unlike traditional investments such as stocks or bonds, which can be easily bought or sold on public markets, alternative investments are often more difficult to liquidate. For example, selling a piece of real estate or a work of fine art can take a significant amount of time and effort, making these investments less liquid than their traditional counterparts. This lack of liquidity can pose a risk to investors, as they may not be able to quickly convert these assets into cash when needed.

B is incorrect. Transparency refers to the availability of information about an investment, including its value, risks, and the processes involved in its management. Traditional investments, such as publicly traded stocks, are subject to strict regulatory requirements that mandate the disclosure of a wide range of information. In contrast, alternative investments often lack this level of transparency. For instance, the value of a piece of fine art or a private real estate investment can be difficult to determine without expert appraisal. Similarly, the risks associated with these types of investments can be complex and difficult to fully understand. This lack of transparency can make alternative investments more risky than traditional ones.

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

Q.67 The value of a forward contract at expiration is the value of the asset:

A. plus the forward price.

B. minus the forward price.

C. minus the present value of the forward price

The value of a forward contract at expiration is the value of the asset minus the forward price. This is because a forward contract is a derivative financial instrument that obligates the buyer to purchase an asset, and the seller to sell an asset, at a set price at a future date. The value of the forward contract at expiration is determined by the difference between the value of the underlying asset and the agreed-upon forward price. If the value of the asset is higher than the forward price, the buyer of the contract will profit, and if it is lower, the seller will profit.

A is incorrect. The value of a forward contract at expiration is not determined by adding the value of the asset to the forward price. Instead, it is determined by the difference between the value of the asset and the forward price. If the value of the asset were to be added to the forward price, it would inflate the value of the contract, which is not how forward contracts work.

C is incorrect. The value of the forward price is not relevant at the expiration of the contract. The present value of the forward price is used to determine the value of the contract during its life, not at its expiration. At expiration, the value of the contract is determined by the difference between the value of the asset and the forward price. .

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.68 Which of the following is *least likely* a private equity strategy?

    A. venture capital.

    B. leveraged buyouts.

    C. mezzanine financing.

Mezzanine financing is a hybrid of debt and equity financing that is typically used to finance the expansion of existing companies. It is a form of capital that is provided to a business at a critical stage of its growth. It is often associated with venture capital financing, but it is not a private equity strategy in itself. At the mezzanine financing stage, a company is preparing to go public. The company is financed until it finalizes an Initial Public Offering (IPO) or until it is sold. However, this does not make it a private equity strategy as it is more of a transitional phase in a company's growth and development, rather than a strategy for acquiring and managing private companies.

A is incorrect. Venture capital is indeed a private equity strategy, but it is not the correct answer to this question. Venture capital involves investing in private companies with high growth potential. Venture capitalists provide funding to startups deemed to have high growth potential in exchange for an equity stake. This could be funding startup companies or supporting small companies that wish to expand but do not have access to equities markets. Venture capitalists take on the risk of financing risky start-ups in the hopes that some of the firms they support will become successful and make a return on their investment.

B is incorrect. Leveraged buyouts are also a private equity strategy, but again, not the correct answer to this question. A leveraged buyout is a strategy that arises when private equity firms create buyout funds, also known as the LBO fund, to acquire developed private companies or public companies. The acquired company becomes privately owned after the buyout has taken place. In a leveraged buyout, the acquiring company uses the assets of the target company as collateral for the loan used to finance the acquisition. The target company's cash flow is used to pay off the debt over time. This strategy is used to acquire a controlling interest in a company's equity and where a significant percentage of the purchase price is financed through leverage (borrowing).

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.69 A synthetic put is *most likely* equivalent to:

    A. a long call, a short underlying asset, and a long bond.

    B. a short call, a long underlying asset, and a short bond.

    C. a long call, a short underlying asset, and a short bond.

The put-call parity principle in finance is a fundamental concept in options pricing. The put-call parity equation is represented as $C_o + \frac{X}{(1+r)^t} = P_o + S_o$, where C_o is the price of the European call option, P_o is the price of the European put option, S_o is the spot price (current market price) of the underlying, and $\frac{X}{(1+r)^t}$ is the present value of the strike price discounted from the value on the expiration date at the risk-free rate.

By rearranging the equation to make the synthetic put the subject, we get $P_o = C_o + \frac{X}{(1+r)^t} - S_o$. This equation shows that a synthetic put is created by combining a long call, a short position in the underlying asset, and a long position in the risk-free bond. This combination replicates the payoff structure of a put option, hence the term 'synthetic put'. The long call provides the potential for upside gain, the short position in the underlying asset provides protection against downside risk, and the long bond provides a fixed return, replicating the payoff of a put option.

B is incorrect. This option suggests that a synthetic put is equivalent to a short call, a long underlying asset, and a short bond. However, this contradicts the put-call parity principle. A short call would expose the investor to unlimited potential losses, while a long underlying asset would expose the investor to downside risk, which is not the characteristic of a put option. Furthermore, a short bond would not provide the fixed return that is characteristic of a put option.

C is incorrect. This option suggests that a synthetic put is equivalent to a long call, a short underlying asset, and a short bond. While the long call and short underlying asset are correct, the short bond is not. A short bond would not provide the fixed return that is characteristic of a put option. Instead, it would expose the investor to potential losses if interest rates decrease, which is not the characteristic of a put option.

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.70 Which of the following is *least likely* an example of an equity hedge strategy?

    A. Short bias.

    B. Merger arbitrage.

    C. Fundamental value.

Merger arbitrage is typically classified as an event-driven strategy rather than an equity hedge strategy. This strategy involves purchasing the stock of a company that is being acquired and selling the stock of the acquiring company. This is done when a merger or acquisition is announced, with the expectation that the stock of the company being acquired will increase in value, while the stock of the acquiring company will decrease. The aim of this strategy is to profit from the price differential between the two stocks. This strategy is dependent on the successful completion of the merger or acquisition, and is therefore subject to a high level of risk.

Option A is incorrect. Short bias is indeed an equity hedge strategy. This strategy involves using quantitative (technical) and/or fundamental analysis to identify equity securities that are overvalued. Once these securities are identified, the hedge fund will take a short position, meaning they will sell the security with the expectation that its price will decrease. This strategy is used to profit from the anticipated decrease in the price of the overvalued security. The short bias strategy is a common approach used in equity hedge strategies

Option C is incorrect. Fundamental value is also an equity hedge strategy. This strategy involves using fundamental analysis to identify companies that are undervalued. Once these companies are identified, the hedge fund will take a long position, meaning they will buy the security with the expectation that its price will increase. This strategy is used to profit from the anticipated increase in the price of the undervalued security. The fundamental value strategy is another common approach used in equity hedge strategies.

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

Q.71 Which of the following statement is *most likely* true about the behavior of investors in bubbles?

     A. Overconfident investors lead to an increase in market volatility.

     B. Rational investors expect a future crash and know the exact timings.

     C. Regret aversion discourages investors from participating in a bubble as they believe the value of stocks is likely to depreciate, resulting in losses.

Overconfidence is a common trait among investors in a bubble market. This overconfidence often leads to an increase in market volatility. Investors, driven by their overconfidence, tend to make more trades, which increases the volume of transactions in the market. This increased activity can cause significant price swings, leading to increased market volatility. Overconfident investors may also be more likely to take on riskier investments, which can further contribute to market volatility. Therefore, the statement that overconfident investors lead to an increase in market volatility is most likely true about the behavior of investors in bubbles.

B is incorrect. While it is true that rational investors may expect a future crash during a bubble, they typically do not know the exact timings of the crash. Predicting the exact timing of a market crash is extremely difficult, if not impossible, due to the numerous factors that can influence market conditions. Even the most experienced and knowledgeable investors cannot accurately predict the exact timing of a market crash. Therefore, the statement that rational investors expect a future crash and know the exact timings is not likely true about the behavior of investors in bubbles.

C is incorrect. Regret aversion does not necessarily discourage investors from participating in a bubble. In fact, it may encourage participation. Regret aversion is the tendency to avoid making decisions that could lead to regret in the future. During a bubble, investors may see the value of stocks rapidly increasing and fear missing out on potential gains. This fear of regret can lead them to invest in the bubble, despite the risk of a future crash. Therefore, the statement that regret aversion discourages investors from participating in a bubble as they believe the value of stocks is likely to depreciate, resulting in losses, is not likely true about the behavior of investors in bubbles.

CFA Level 1, Topic 8 – Portfolio Management, Learning Module 3–The Behavioral Biases of Individuals, LOS 5c: Describe how behavioral biases of investors can lead to market characteristics that may not be explained by traditional finance.

Q.72 A county wants to build a state-of-the-art maximum correctional facility. The county is *most likely* engaging in what type of a project?

      A. Greenfield project.

      B. Brownfield project.

      C. Construction project.

A Greenfield project refers to the development of a project from scratch, where no existing structures or facilities are present. This is typically the case when a new infrastructure project is initiated, such as the construction of a new correctional facility. The term 'Greenfield' is derived from the concept of building on undeveloped, green land. The advantage of a Greenfield project is that it allows for a high degree of flexibility and customization, as the project is not constrained by any pre-existing structures or designs. This is why option A is the correct answer.

B is incorrect. A Brownfield project refers to the redevelopment or refurbishment of existing structures or facilities. This typically involves upgrading or modifying the existing infrastructure to meet new requirements or standards. While a Brownfield project can also involve the construction of a correctional facility, the question specifically mentions that the county wants to build a 'state-of-the-art' facility. This suggests that they are looking to develop a new facility from scratch, rather than refurbishing an existing one. Therefore, a Brownfield project would not be the most likely type of project in this case.

C is incorrect. While it is true that the construction of a new correctional facility would involve a construction project, this option is too broad and does not accurately reflect the specific type of project that the county is most likely engaging in. Infrastructure projects can indeed be categorized as either Greenfield or Brownfield projects, depending on the level of development of the underlying asset. In this case, the county is looking to build a new facility from scratch, which is more accurately described as a Greenfield project rather than a generic construction project.

CFA Level 1, Topic 8 – Alternative Investments, Learning Module 4 –Real Estate and Infrastructure, LOS 4c: explain features and characteristics of infrastructure.

Q.73 Which of the following is *least likely* a characteristic that makes a firm attractive for a leveraged buyout?

      A. High leverage.

      B. Poor management.

      C. Strong and consistent cash flows.

Leveraged buyouts (LBOs) are financial transactions where a company is purchased with a significant amount of borrowed money to meet the cost of acquisition. The assets of the company being acquired are often used as collateral for the loans, along with the assets of the acquiring company. The purpose of leveraged buyouts is to allow companies to make large acquisitions without having to commit a lot of capital.

In an LBO, the ratio of debt to equity is high (hence the term 'leveraged'), and the company's existing debt level is a crucial factor in determining whether it is a suitable candidate for an LBO. A company with high leverage (i.e., a high level of debt compared to equity) is less attractive for an LBO because it is already burdened with significant debt. Adding more debt to finance the buyout could strain the company's cash flows and make it difficult to service the debt. This could lead to financial distress and even bankruptcy, making the LBO a risky proposition.

B is incorrect. Contrary to what might be expected, poor management can actually make a firm more attractive for a leveraged buyout. This is because the buyers in an LBO often believe that they can improve the company's performance by managing it better. If a company is poorly managed, it may not be realizing its full potential in terms of profitability and cash flow generation. Therefore, an LBO could be an opportunity to turn the company around and create value.

C is incorrect. Strong and consistent cash flows are actually a desirable characteristic for a leveraged buyout. This is because the cash flows can be used to service the debt used to finance the buyout. A company with strong and consistent cash flows is likely to be able to meet its debt obligations, reducing the risk of financial distress and bankruptcy. Therefore, strong and consistent cash flows make a company more, not less, attractive for a leveraged buyout.

CFA Level 1, Topic 8 – Alternative Investments, Learning Module 3 –Investments in Private Capital: Equity and Debt, LOS 3b: Explain features of private equity and its investment characteristics

Q.74 Consider an April USD 190 put on the stock of Facebook. If FB is currently worth USD 175, which of the following statements is *most likely* correct?

    A. The option is currently in the money.

    B. The option is currently out of the money.

    C. The option is currently at the money.

The moneyness of an option is determined by the position of the price of the underlying asset relative to the strike price of the option. In the context of a put option, it is considered 'at the money' when the strike price of the put option is equal to the current market price of the underlying asset. It is 'in the money' when the strike price of the put option is greater than the current market price of the underlying asset. Conversely, it is 'out of the money' when the strike price of the put option is less than the current market price of the underlying asset.

Let's denote the price of the underlying asset as St and the strike price as X. Therefore, for a put option:

If X > St, the put option is in the money.

If X < St, the put option is out of the money.

If X = St, the put option is at the money.

Applying this to the given scenario where Facebook's stock price is USD 175, all put options with strike prices at USD 175 and above are considered 'in the money'. This is because the strike price is greater than the current market price of the underlying asset. Hence, the USD 190 put option on Facebook's stock is 'in the money'.

B is incorrect. This option suggests that the put option is currently 'out of the money'. However, as explained above, a put option is 'out of the money' when the strike price is less than the current market price of the underlying asset. In this case, the strike price of USD 190 is greater than the current market price of USD 175, hence the put option is not 'out of the money'.

C is incorrect. This option suggests that the put option is currently 'at the money'. However, a put option is 'at the money' when the strike price is equal to the current market price of the underlying asset. In this case, the strike price of USD 190 is not equal to the current market price of USD 175, hence the put option is not 'at the money'.

CFA Level 1, Topic 8 –Derivatives, Learning Module 8 – Pricing and Valuation of Options, LOS 8a: Explain the exercise value, moneyness, and time value of an option.

Q.75 AlphaC Fund enters into an equity swap with an investment bank. AlphaC agrees to pay the return on the Emerging index and receive the return on the North American index. The swap's notional principal is $100 million.

	Start	3 months
North American index	1,500	1,432
Emerging index	899	1,031

The net amount AlphaC has to receive/pay after 3 months is *closest to*:

A. Pay $4.53 million.

B. Receive $14.68 million.

C. Pay $19.21 million.

In the given scenario, AlphaC Fund has entered into an equity swap with an investment bank. In this swap, AlphaC has agreed to pay the return on the Emerging index and receive the return on the North American index. The notional principal of the swap is $100 million. The question asks for the net amount that AlphaC has to receive/pay after 3 months.

Firstly, let's understand what an equity swap is. An equity swap is a financial derivative contract where a set of future cash flows are agreed to be exchanged between two parties at set dates in the future. The cash flows are calculated over a notional principal amount. The cash flows are determined by applying an agreed upon return on a notional amount of two different equity indices.

In this case, the return on the Emerging index is calculated as follows: (1031/899 - 1) x 100 million = $14.68 million. This is the amount that AlphaC has to pay.

On the other hand, the return on the North American index is calculated as follows: (1432/1500 - 1) x 100 million = -$4.53 million. This is the amount that AlphaC receives.

The net amount that AlphaC has to pay is the difference between the amount it has to pay and the amount it receives. This is calculated as: $14.68 million + $4.53 million = $19.21 million. Hence, AlphaC has to pay $19.21 million after 3 months.

CFA Level 1, Topic 8 – Alternative Investments, Learning Module 7 – Pricing and Valuation of Interest Rates and Other Swaps, LOS 7b: Contrast the value and price of swaps.

Q.76 Graco Fund of Funds (FOF) invests $50 million each in the hedge funds, Lexor and Polygon. Graco FOF quotes a '2 and 20' free structure. The management fees are calculated based on asset values at year-end, while incentive fees are calculated independently of management fees. At year-end, the value of the investment in Lexor and Polygon was $45 million and $62 million, respectively. The investor's net-of-fees return is *closest to*:

      A. 3.46%

      B. 3.89%

      C. 7.00%

The value of the investment at the end of the year is $45 million (from Lexor) plus $62 million (from Polygon), which equals $107 million. The initial investment value was $50 million (into Lexor) plus $50 million (into Polygon), which equals $100 million. The management fee, which is 2% of the year-end asset value, is $107 million times 0.02, which equals $2.14 million. The incentive fee, which is 20% of the increase in asset value, is ($107 million minus $100 million) times 0.20, which equals $1.40 million. The total fees paid are the sum of the management fee and the incentive fee, which is $2.14 million plus $1.40 million, which equals $3.54 million. The net-of-fees return is the increase in asset value minus the total fees paid, divided by the initial investment value, which is ($107 million minus $100 million minus $3.54 million) divided by $100 million, which equals 0.0346 or 3.46%.

B is incorrect. The 3.89% is the investor's net-of-fees return calculated net of management fees, but not including the incentive fee. The calculation is as follows: The management fee is $107 million times 0.02, which equals $2.14 million. The incentive fee is ($107 million minus $100 million minus $2.14 million) times 0.20, which equals $0.972 million. The total fees paid are $2.14 million plus $0.972 million, which equals $3.112 million. The net-of-fees return is ($107 million minus $100 million minus $3.112 million) divided by $100 million, which equals 0.0389 or 3.89%. This calculation is incorrect because it does not correctly account for the incentive fee.

C is incorrect. The 7% has been incorrectly obtained by calculating the holding period return of the fund, not the net-of-fees return. The calculation is as follows: The holding period return is ($107 million minus $100 million) divided by $100 million, which equals 0.07 or 7%. This calculation is incorrect because it does not take into account the fees paid to the fund manager.

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.77 Which of the following statements *best* describes the difference between permissioned and permissionless networks?

      A. Both permissioned and permissionless networks restrict who can participate in the network.

      B. Permissionless networks are open to all participants, while permissioned networks restrict who can participate in the network.

      C. Permissioned networks are open to all participants, while permissionless networks restrict who can participate in the network.

A permissionless network, also known as a public blockchain, is open to anyone who wishes to participate. There are no restrictions or permissions required to join the network, validate transactions, or create new blocks. This openness fosters a high level of transparency as anyone can verify the transactions. Bitcoin and Ethereum are prime examples of permissionless networks, where anyone with internet access can participate in the network activities.

Contrarily, a permissioned network, also known as a private blockchain, restricts participation. Only authorized participants can validate transactions and create new blocks. This type of network is often used by businesses and organizations for its increased efficiency and security. The level of access control for participation in the network is higher, which can lead to faster transaction times and increased privacy. However, this comes at the cost of reduced transparency as the network activities are only visible to the authorized participants.

A is incorrect. This statement inaccurately suggests that both permissioned and permissionless networks restrict participation. This is not true as permissionless networks are open to all participants. The key characteristic of permissionless networks is their openness and lack of restrictions on participation, which is not reflected in this option.

C is incorrect. This statement incorrectly reverses the characteristics of permissioned and permissionless networks. In reality, it is the permissioned networks that restrict participation, not the permissionless networks. Permissionless networks are open to all participants, allowing anyone to join, validate transactions, and create new blocks. This openness is a defining feature of permissionless networks, which is misrepresented in this option.

CFA Level 1, Topic 8 – Alternative Investments, Learning Module 7 – Introduction to Digital Assets, LOS 7a: Describe financial applications of distributed ledger technology.

Q.78 An investor would *least likely* invest in commodities to

      A. diversify his portfolio.

      B. increase his portfolio's return.

      C. hedge against unexpected inflation.

Commodities do not necessarily increase a portfolio's return. Commodities are a type of investment that can be highly volatile and unpredictable. While they can provide high returns in certain market conditions, they can also lead to significant losses. The performance of commodities is largely dependent on a variety of factors such as supply and demand dynamics, geopolitical events, and economic indicators. Therefore, an investor cannot rely solely on commodities to increase his portfolio's return. It is important for an investor to have a diversified portfolio that includes a mix of different asset classes to mitigate risk and achieve a balanced return.

A is incorrect. Investing in commodities can actually help to diversify a portfolio. Diversification is a risk management strategy that involves spreading investments across various financial instruments, industries, and other categories to reduce exposure to any one particular asset or risk. Commodities have a low correlation with other asset classes such as stocks and bonds, meaning they often perform well when these other assets are performing poorly. Therefore, including commodities in a portfolio can help to reduce risk and increase the potential for returns.

C is incorrect. Commodities are often used as a hedge against unexpected inflation. This is because the prices of commodities tend to rise when inflation increases. For example, if the price of goods and services increases due to inflation, the price of commodities such as gold and oil are likely to increase as well. Therefore, by investing in commodities, an investor can protect his portfolio from the negative effects of inflation.

CFA Level 1, Topic 8 – Alternative Investments, Learning Module 5– Natural Resources, LOS 5c: Analyze sources of risk, return, and diversification among natural resource investments.

Q.79 The following table presents information about XYZ hedge fund.

	Millions
Fund assets at the beginning of the period	100
Fund assets at the end of the period	120
Management fee	2%
Incentive fee	10%
Soft hurdle rate	15%

Assuming that the incentive fee is calculated independently of the management fee, and the management fee is calculated based on the value at the end of the year. An investor's net-of-fees

return is *closest to*:

    A. 12.6%

    B. 15.6%

    C. 17.6%

The calculation of this percentage is based on the management fee and the incentive fee. The management fee is calculated as 2% of the fund assets at the end of the period, which is 120 million. This gives us a management fee of 2.4 million. The incentive fee is calculated as 10% of the increase in fund assets, which is 20 million (120 million - 100 million). This gives us an incentive fee of 2 million. The total fees are therefore 4.4 million (2.4 million + 2 million). The return to investors is calculated as the end of period fund assets minus the total fees, divided by the beginning of period fund assets, minus 1, and then multiplied by 100. This gives us a return to investors of 15.6%.

A is incorrect. The percentage of 12.6% seems to have been calculated by incorrectly using the soft hurdle rate as the incentive fee percentage. The soft hurdle rate is a minimum rate of return that a hedge fund must achieve before it can charge an incentive fee. However, in this case, the incentive fee is clearly stated as 10% of the increase in fund assets. Therefore, using the soft hurdle rate of 15% to calculate the incentive fee would give an incorrect result. The correct calculation should be as follows: the end of period fund assets minus the management fee and the correctly calculated incentive fee, divided by the beginning of period fund assets, minus 1, and then multiplied by 100. This gives a return to investors of 15.6%, not 12.6%.

C is incorrect. The percentage of 17.6% seems to have been calculated by incorrectly assuming the incentive fee. The incentive fee is a percentage of the increase in fund assets, and it is only payable if the fund's return surpasses the hurdle rate. In this case, the fund's return of 20% has indeed surpassed the hurdle rate of 15%, so the incentive fee is payable. Therefore, neglecting the incentive fee in the calculation would give an incorrect result. The correct calculation should be as follows: the end of period fund assets minus the management fee and the correctly calculated incentive fee, divided by the beginning of period fund assets, minus 1, and then multiplied by 100. This gives a return to investors of 15.6%, not 17.6%.

CFA Level 1, Topic 9 – Alternative Investments, Learning Module 2 – Alternative Investment Performance and Returns, LOS 2b: Calculate and interpret alternative investment returns both before and after fees.

Q.80 The expected return of the Karachi Stock exchange is 17%, and the rate on Pakistan's risk-free bonds is 7.5%. Suppose the beta of Bata Corporation shares is 0.75, then the required rate of return on Bata Corporation's shares is *closest to*:

    A. 14.63%.

    B. 20.25%.

    C. 16.73%.

The required rate of return on shares is calculated using the Capital Asset Pricing Model (CAPM). The CAPM describes the relationship between systematic risk and expected return for assets, particularly stocks. It is commonly used to estimate the expected return on an asset, given the risk of that asset, and to calculate the cost of capital for risky securities.

The formula for CAPM is:

$$\text{Required Rate of Return} = \text{Risk-Free Rate} + \beta \times (\text{Market Return} - \text{Risk-Free Rate})$$

In this case:

- Risk-Free Rate = 7.5%

- Beta (β) of Bata Corporation shares = 0.75

- Expected Market Return (Karachi Stock Exchange) = 17%

Substituting these values into the CAPM formula gives:

$$\text{Required Rate of Return} = 7.5\% + 0.75 \times (17\% - 7.5\%)$$

First, calculate the market risk premium (Market Return − Risk-Free Rate):

$$17\% - 7.5\% = 9.5\%$$

Now, calculate the required rate of return:

$$\text{Required Rate of Return} = 7.5\% + 0.75 \times 9.5\%$$

$$\text{Required Rate of Return} = 7.5\% + 7.125\%$$

$$\text{Required Rate of Return} = 14.625\%$$

B is incorrect. A required rate of return of 20.25% would imply a much higher level of risk than is indicated by the given beta of 0.75. Beta is a measure of a stock's risk in relation to the market. A beta of less than 1 means the security will be less volatile than the market. So, a beta of 0.75 indicates that Bata Corporation's shares are less risky than the overall market, and therefore, the required rate of return should be less than the market return of 17%, not more.

C is incorrect. A required rate of return of 16.73% would suggest a beta higher than 0.75, given the market return of 17% and the risk-free rate of 7.5%. As explained above, a beta of 0.75 indicates less risk than the overall market, and therefore, the required rate of return should be less than the market return, not close to it.

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 The beta of a fund is 1.4. If the expected return on T-bills is 3% and the standard deviation of the market is 9%, then the covariance between the market portfolio and the fund is *closest to*:

    A. 0.0013.

    B. 0.0113.

    C. 0.1260.

The correct answer is option B, which states that the covariance between the market portfolio and the fund is 0.0113. This is derived from the formula for calculating the beta of a fund, which is the covariance of the fund's returns with the market's returns divided by the variance of the market's returns. In mathematical terms, this is represented as:

$$\text{Beta} = \frac{\text{Cov}(R_i,\ R_m)}{\delta_m^2}$$

Where:

$\text{Cov}(R_i, R_m)$ represents the covariance between the fund and the market, and δ_m^2 represents the variance of the market.

Given that the beta of the fund is 1.4 and the standard deviation of the market is 9% (or 0.09), we can substitute these values into the formula to find the covariance. This gives us:

$$1.4 = \frac{\text{Cov}_{F,M}}{0.09^2}$$

By rearranging the formula, we can solve for the covariance, which gives us:

$$\text{Cov}_{F,M} = (1.4)(0.09)^2 = 0.0113$$

This shows that the covariance between the market portfolio and the fund is 0.0113, which corresponds to option B.

A is incorrect. This option suggests that the covariance is 0.0013. However, this value appears to have been incorrectly derived by using the expected return on the T-bills (3%) in place of the fund's beta (1.4).

C is incorrect. This option suggests that the covariance is 0.126. However, this value appears to have been incorrectly derived by using the standard deviation of the market (9% or 0.09) instead of the variance of the market (0.09 squared or 0.0081). The standard deviation is the square root of the variance, so using the standard deviation in place of the variance would result in a significantly larger covariance.

CFA Level 1, Topic 9 – Portfolio Management, Learning Module 2 – Portfolio Risk and Return: Part II, LOS 2e: Calculate and interpret beta.

Q.82 An investor enters a cash-settled forward contract with an oil drilling company to purchase 500 barrels at a forward price of $62.30 per barrel. The spot price today and at contract maturity are $60.00 and $61.50, respectively. To settle the contract at maturity, the investor will *most likely*:

    A. pay $0.80.

    B. pay $400.

    C. receive $1,150.

The formula for the investor's payoff at maturity is $S_T - F_0(T)$. Here, S_T represents the spot price at maturity and $F_0(T)$ represents the forward price. In this case, the spot price at maturity is $61.50 and the forward price is $62.30. Therefore, the investor's payoff at maturity is calculated as $61.50 - $62.30, which equals -$0.80. This negative value indicates that the investor will have to pay the oil drilling company, rather than receiving money.

However, this is the payoff for each barrel of oil. The contract was for 500 barrels of oil, so we need to multiply the payoff by 500 to find the total amount the investor will pay. This gives us -$0.80 * 500, which equals -$400. Therefore, the investor will pay $400 to the oil drilling company at contract maturity.

A is incorrect. This option suggests that the investor will pay $0.80. However, this is incorrect because $0.80 is the investor's payoff for each of the 500 barrels of oil, not the total amount the investor will pay to the oil drilling company. The total amount is calculated by multiplying the payoff per barrel by the number of barrels, which gives us -$400, not $0.80.

C is incorrect. This option suggests that the investor will receive $1,150. However, this is incorrect because it seems to have been calculated using the spot price at contract initiation instead of the spot price at contract maturity. The spot price at contract initiation is irrelevant to the calculation of the investor's payoff at maturity. The correct calculation uses the spot price at maturity, which gives us a payoff of -$400, not a receipt of $1,150.

CFA Level 1, Topic 9 – 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.83 Stock A's expected return is 5%, and its standard deviation is 12%. Stock B's expected return is 12%, and its standard deviation is 17%. What is the standard deviation of a portfolio composed of 40% stock A and 60% stock B, given that the correlation between the two stocks is 0.5?

    A. 1.76%.

    B. 13.27%.

    C. 39.04%.

TThe formula for the standard deviation of a portfolio is:

$$\sigma_P = \sqrt{w_A{}^2\sigma_A{}^2 + w_B{}^2\sigma_B{}^2 + 2\rho w_A w_B \sigma_A \sigma_B}$$

Where:

σ_P is the standard deviation of the portfolio,

w_A and w_B are the weights of stocks A and B in the portfolio,

σ_A and σ_B are the standard deviations of stocks A and B,

and ρ is the correlation between the two stocks.

Substituting the given values into the formula, we get:

$$\sigma_P = \sqrt{0.4^2 0.12^2 + 0.6^2 0.17^2 + 2 \times 0.5 \times 0.4 \times 0.6 \times 0.12 \times 0.17} = 0.1327$$

A is incorrect. This option suggests that the standard deviation of the portfolio is 1.76%. However, this is not correct because 1.76% is the portfolio's variance, not its standard deviation. The standard deviation is obtained by taking the square root of the variance, which in this case would be greater than 1.76%.

C is incorrect. This option suggests that the standard deviation of the portfolio is 39.04%. This is not correct because this value has been incorrectly obtained by failing to square the entries of the first two parts of the equation in the formula for the standard deviation of a portfolio. Squaring these entries is necessary because the standard deviation is a measure of dispersion, which is always a positive value. By not squaring these entries, the calculation would yield a negative value, which is not possible for a standard deviation.

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

Q.84 Given the CAPM model, Company A is expected to return 10% to its investors. The expected return of the market is 8%, and the risk-free rate is 3%. Company A's beta is *closest to:*

A. 0.88.

B. 0.71.

C. 1.40.

The Capital Asset Pricing Model (CAPM) is a financial model used to determine the expected return on an investment based on its risk. It is commonly applied to estimate the cost of equity capital. The model assumes that investors require a return commensurate with the level of risk associated with the investment. The formula for CAPM is:

$$\text{Expected Return} = \text{Risk-Free Rate} + \beta \times (\text{Market Return} - \text{Risk-Free Rate})$$

In this question, we are given the following:

- Expected return of Company A = 10%

- Expected return of the market = 8%

- Risk-free rate = 3%

We are asked to find the beta (β) of Company A, which measures the systematic risk of the investment. We can rearrange the CAPM formula to solve for β:

$$\beta = \frac{\text{Expected Return} - \text{Risk-Free Rate}}{\text{Market Return} - \text{Risk-Free Rate}}$$

Substituting the given values into the formula:

$$\beta = \frac{10\% - 3\%}{8\% - 3\%}$$

$$\beta = \frac{7\%}{5\%} = 1.4$$

A is incorrect. A beta of 0.88 would imply that Company A's expected return is less than the market return, which contradicts the information given in the question. The beta is a measure of systematic risk, and a beta less than 1 indicates that the investment is less risky than the market. However, in this case, the expected return of Company A is higher than the market return, which suggests that the investment is more risky than the market.

B is incorrect. A beta of 0.71 would also imply that Company A's expected return is less than the market return, which contradicts the information given in the question. As explained above, a beta less than 1 indicates that the investment is less risky than the market. However, the expected return of Company A is higher than the market return, which suggests that the investment is more risky than the market.

Q.85 An analyst has recently read a research paper developed at a renowned university that says that the prices of derivatives are also sensitive to the changes in interest rates. If the analyst is interested in measuring such changes, then the best metric he should use is:

    A. Rho.

    B. Delta.

    C. Gamma.

Rho is a measure of the sensitivity of the price of a derivative to changes in the interest rate. It is one of the five main Greek letters used in the financial industry to measure risk and is specifically used to indicate the rate of change between an option's price and a 1% change in the interest rate. This means that if the Rho of a derivative is 0.5, for example, then the price of the derivative will increase or decrease by 0.5% for every 1% increase or decrease in the interest rate. This makes Rho an essential tool for analysts who are interested in understanding how changes in interest rates can affect the prices of derivatives.

A is incorrect. While it is true that Delta measures the degree to which an option is exposed to changes in the underlying asset's price, it does not measure the sensitivity of the price of a derivative to changes in the interest rate. Delta is used to measure the rate of change between an option's price and a $1 change in the price of the underlying asset. For example, if an option has a Delta of 0.75, this means that for every $1 change in the price of the underlying asset, the price of the option will change by $0.75. While this is an important measure for understanding the price sensitivity of an option, it does not provide any information about how changes in the interest rate can affect the price of the derivative.

B is incorrect. Gamma is another one of the five main Greek letters used in the financial industry to measure risk, but it does not measure the sensitivity of the price of a derivative to changes in the interest rate. Instead, Gamma measures the rate of change in the Delta for each $1 change in the price of the underlying asset. This means that if the Gamma of an option is 0.1, for example, then the Delta of the option will increase or decrease by 0.1 for every $1 change in the price of the underlying asset. While this is an important measure for understanding how changes in the price of the underlying asset can affect the Delta of an option, it does not provide any information about how changes in the interest rate can affect the price of the derivative.

CFA Level 1, Topic 9 – Portfolio Management, Learning Module 4– Introduction to Risk Management, LOS 4g: Describe methods for measuring and modifying risk exposures and factors to consider in choosing among the methods.

Q.86 Which adjustment to the performance fee gives limited partners the right to retrieve a share of the general partner's performance fee?

    A. Side letter

    B. High-water mark

    C. Clawback provision

The clawback provision is a term used in the private equity (PE) world. It refers to a situation where the general partner (GP) of a PE fund may be required to return part of its performance fee to the limited partners (LPs). This situation arises when the GP has received performance fees based on the fund's early profitable deals, but later deals in the fund's life cycle do not perform as well, resulting in an overall lower return for the LPs. The clawback provision is designed to ensure that the GP's performance fee is aligned with the fund's overall performance, rather than being based on individual deal performance. This provision is a critical part of the alignment of interests between the GP and the LPs, ensuring that the GP is incentivized to manage the fund in a way that maximizes the overall return for the LPs.

A is incorrect. A side letter is an agreement that is used in the private equity world to alter the terms of the Limited Partnership Agreement (LPA) between the GP and one or more LPs. While side letters can be used to modify many aspects of the LPA, they do not give LPs the right to retrieve a share of the GP's performance fee. Instead, side letters are typically used to provide certain LPs with preferential terms, such as reduced management fees or enhanced reporting rights. Therefore, while side letters can impact the GP's compensation, they do not provide a mechanism for LPs to claw back a portion of the GP's performance fee.

B is incorrect. The high-water mark is a concept used in the hedge fund industry to ensure that fund managers are only paid a performance fee for generating net new returns. The high-water mark is the highest value that the fund has reached as of a performance calculation date, after accounting for fees and expenses. If the fund's value falls below this high-water mark, the fund manager does not earn a performance fee until the fund's value rises above the high-water mark. While the high-water mark can impact the calculation of the fund manager's performance fee, it does not provide a mechanism for investors to retrieve a portion of the performance fee. Therefore, the high-water mark does not give LPs the right to retrieve a share of the GP's performance fee.

CFA level 1, Topic 9 – Alternative Investments, Learning Module 2 - Alternative Investment: Performance and Returns, LOS 2b: Calculate and interpret alternative investment returns both before and after fees.

Q.87 Portfolio ABC has a beta of 1.6 and generated a return of 21%. If the risk-free rate is 2% and the market premium is 10%, Jensen's alpha for this portfolio is *closest to*:

    A. 2.

    B. 3.

C. 4.

Jensen's alpha is a risk-adjusted performance measure that represents the average return on a portfolio over and above that predicted by the capital asset pricing model (CAPM), given the portfolio's beta and the average market return. This is its theoretical definition. In practice, Jensen's alpha is used as an indicator of a manager's ability to generate excess returns. It is calculated using the formula:

$$\text{Jensen's Alpha} = R_p - [R_f + \beta(R_m - R_f)]$$

Where:

R_p = Expected portfolio return

R_f = Risk-free rate

β = Beta of the portfolio

R_m = Expected market return

Given the values in the question, we can substitute them into the formula:

$$\alpha_{ABC} = 21 - (2 + 1.6 \times 10)$$

This simplifies to:

$$\alpha_{ABC} = 21 - (2 + 16)$$

Which further simplifies to:

$$\alpha_{ABC} = 21 - 18 = 3$$

A is incorrect. If we substitute the value of 2 into the formula for Jensen's alpha, we would get a different result. This would imply that the portfolio's return is less than what is predicted by the CAPM, given its beta and the average market return. This would suggest that the portfolio is underperforming, which contradicts the given information that the portfolio generated a return of 21%.

C is incorrect. If we substitute the value of 4 into the formula for Jensen's alpha, we would get a result that is higher than the actual return of the portfolio. This would imply that the portfolio's return is more than what is predicted by the CAPM, given its beta and the average market return. This would suggest that the portfolio is overperforming, which also contradicts the given information that the portfolio generated a return of 21%.

CFA Level 1, Topic 9 – Portfolio Management, Learning Module 2 – Portfolio Risk and Return: Part II, LOS 2i: calculate and interpret the Sharpe ratio, Treynor ratio, M2, and Jensen's alpha.

Q.88 Two stocks in different industries will create a perfectly diversified portfolio if the correlation coefficient is:

A. -1.

B. 0.

C. 1.

The correlation coefficient measures the relationship between two stocks. In the context of portfolio diversification, a correlation coefficient of -1 is ideal. This is because a correlation coefficient of -1 indicates a perfect negative correlation between the two stocks. In other words, when one stock's price increases, the other stock's price decreases by a proportionate amount, and vice versa. This perfect negative correlation allows for optimal diversification because the gains from one stock can offset the losses from the other, thereby reducing the overall risk of the portfolio.

B is incorrect. A correlation coefficient of 0 implies that there is no relationship between the movements of the two stocks. This means that the price movements of the two stocks are completely independent of each other. While this lack of correlation does provide some level of diversification, it is not optimal. This is because the gains from one stock do not necessarily offset the losses from the other, which means that the overall risk of the portfolio is not minimized.

C is incorrect. A correlation coefficient of 1 indicates a perfect positive correlation between the two stocks. This means that the two stocks move in the same direction. If one stock's price increases, the other stock's price also increases by a proportionate amount, and vice versa. This lack of diversification is problematic because if one stock experiences a loss, the other stock is also likely to experience a loss. As a result, the overall risk of the portfolio is increased, which is contrary to the goal of diversification.

CFA Level 1, Topic 9 – Portfolio Management, Learning Module 1 – Portfolio Risk and Return: Part I, LOS 1f: Describe the effect on a portfolio's risk of investing in assets that are less than perfectly correlated.

Q.89 Which of the following is *least likely* considered a constraint when preparing an investment policy statement?

      A. Risk tolerance.

      B. Liquidity needs.

      C. Legal and regulatory factors.

When preparing an investment policy statement (IPS), the constraints typically considered include liquidity needs, time horizon, taxes, legal and regulatory factors, and unique needs and preferences. However, risk tolerance is not considered a constraint but rather an investment objective.

A is incorrect. Risk tolerance is a crucial factor in determining the investment objectives of a policy statement. It is a measure of the degree of uncertainty that an investor can handle regarding a negative change in the value of his or her portfolio. It is not considered a constraint because it does not limit the investment options or strategies but rather guides them. It helps in determining the appropriate asset allocation for the investor's portfolio that aligns with the investor's profile.

B is incorrect. Liquidity needs are indeed a constraint when preparing an IPS. The IPS should state the likely date of withdrawal of funds from the portfolio. If a client has a known liquidity requirement, the portfolio manager should allocate a part of the portfolio to cover the liability by ensuring that the allocated part can be quickly converted to cash to meet the obligation. Therefore, liquidity needs are a constraint that limits the investment options and strategies and must be considered when preparing an IPS.

C is incorrect. Legal and regulatory factors are also a constraint when preparing an IPS. The IPS should outline any legal and regulatory restrictions that may affect the investment options and strategies. These could include restrictions on certain types of investments or requirements for certain types of investments. Therefore, legal and regulatory factors are a constraint that limits the investment options and strategies and must be considered when preparing an IPS.

CFA Level 1, Topic 9 – Portfolio Management, Learning Module 4– Basics of Portfolio Planning and Construction, LOS 4e: Describe the investment constraints of liquidity, time horizon, tax concerns, legal and regulatory factors, and unique circumstances and their implications for the choice of portfolio assets.

Q.90 Which of the following pooled investment share prices is *most likely* to be significantly different from its net asset value (NAV) per share?

    A. Share price from an open-end fund.

    B. Share price from a closed-end fund.

    C. Share price from an exchange-traded fund.

Unlike open-end funds or exchange-traded funds, a closed-end fund does not create new shares for new investors. Instead, a new investor has to buy the shares from an existing investor. This means that the transactions occur at a premium or discount to the fund's net asset value (NAV), and not at the fund's NAV itself. This is a significant difference from other types of funds, where the share price is typically equal to or very close to the fund's NAV. As a result, the share price of a closed-end fund can be significantly different from the fund's NAV, making option B the correct answer.

A is incorrect. The reason for this is that an open-end fund operates differently from a closed-end fund. An open-end fund accepts new investor inflows and issues the shares to the new investors at the fund's prevailing NAV. This means that the share price of an open-end fund is equal to the fund's NAV. Existing investors can also sell their shares back to the fund at the fund's prevailing NAV. This is a significant difference from a closed-end fund, where the share price can be significantly different from the fund's NAV. Therefore, the share price of an open-end fund is not likely to be significantly different from its NAV, making option A incorrect.

C is incorrect. Exchange-traded funds (ETFs) are a type of fund that investors can buy directly from the fund itself. ETFs are priced throughout the day according to investor demand. This means that the price of an ETF may not be equal to the fund's NAV, but it is always close to the NAV under normal market conditions. This is a significant difference from a closed-end fund, where the share price can be significantly different from the fund's NAV. Therefore, an ETF's share price is not likely to be significantly different from its NAV, making option C incorrect.

CFA Level 1, Topic 9 – Portfolio Management, Learning Module 3 – Portfolio Management: An Overview, LOS 3f: Describe mutual funds and compare them with other pooled investment products.