PRM Exam 1: Finance Foundations

PRMIA 8013

Version Demo

Total Demo Questions: 21

Total Premium Questions: 210

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Topic Break Down

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Topic 1, Foundations of Risk Management	2
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QUESTION NO: 1

It is October. A grower of crops is concerned that January temperatures might be too low and destroy his crop. A heating-degree-days futures contract (HDD futures contract) is available for his city. What would be the best course of action for the grower?

A. In October, sell January HDD contracts

B. In October, buy January HDD contracts

C. In October, buy September HDD contracts

D. In January, buy January HDD contracts

ANSWER: B

Explanation:

In October, buy January HDD contracts is the appropriate hedge because the grower faces a financial loss if January is unusually cold. An HDD index measures cold-weather intensity: for a given day, it is generally based on the extent to which the day's average temperature falls below a specified base temperature. Consequently, colder January temperatures produce a higher accumulated January HDD index.

A long position in a January HDD futures contract has value that increases as the relevant January HDD index, and therefore cold-weather severity, increases. The futures gain can offset the grower's reduced crop value or additional heating/protection costs resulting from damaging low temperatures. Establishing the position in October is important because it locks in a hedge before the January weather outcome becomes known. The contract month also matches the period of the exposure: the grower is concerned specifically with January conditions, so January HDD contracts provide the relevant index settlement.

Weather derivatives are designed to transfer the financial consequences of measurable weather conditions rather than to prevent the weather event itself. CME Group describes its temperature products and the calculation/settlement framework for HDD-based contracts at CME Group Weather Temperature Products. For a broader explanation of weather derivatives as tools for managing weather-related financial risk, see CME Group's introduction to weather derivatives.

QUESTION NO: 2

A receiver option on a swap is a swaption that gives the buyer the right to:

A. swap two options between the two counterparties

B. receive the fixed rate and pay a variable rate

C. receive the swap spread in effect on a future date and pay a variable underlying rate

D. pay the fixed rate and receive a variable rate

ANSWER: B

Explanation:

A receiver swaption gives its holder the right, but not the obligation, to enter an interest-rate swap in which the holder receives the predetermined fixed rate and pays the floating rate. The term "receiver" identifies the fixed-leg direction: the option holder will be the fixed-rate receiver if the swaption is exercised. The fixed swap rate, often called the strike rate, is agreed when the option is purchased, while the floating payments are determined under the applicable floating-rate index and reset conventions over the life of the resulting swap.

This position is valuable when the holder wants the ability to lock in receiving a fixed rate at a future date. Economically, a receiver swaption benefits from a decline in relevant market swap rates because the right to receive the previously agreed fixed rate becomes more attractive relative to then-current rates. The underlying transaction remains a fixed-for-floating interest-rate swap; the swaption merely gives the buyer the election to enter that swap on the contractual exercise date or dates. ISDA describes swaptions as options relating to an interest-rate swap, and CME's interest-rate education materials similarly distinguish receiver swaptions by the right to receive fixed and pay floating. See ISDA's Swaptions documentation overview and CME Group's introduction to interest-rate swaps.

QUESTION NO: 3

The yield offered by a bond with 18 months remaining to maturity is 5%. The coupon is 3%, paid semi-annually, and there are two more coupon payments to go in addition to the interest payment made at maturity. The zero rate for 6 months is 2%, that for 12 months is 3%. What is the 18 month zero rate?

A. 4.03

B. 5.03%

C. 4.81%

D. 6.03%

ANSWER: B

Explanation:

The correct zero rate is **5.03%**, assuming the quoted bond yield and zero rates are nominal annual rates with semiannual compounding. On a par value of 100, the 3% annual coupon produces cash flows of 1.50 at 6 months, 1.50 at 12 months, and 101.50 at 18 months. First, the bond's market price is obtained by discounting these three cash flows at its 5% yield, using a 2.5% rate per semiannual period: $1.5/1.025 + 1.5/1.025^2 + 101.5/1.025^3$, giving approximately 97.14.

Bootstrapping then uses the known spot rates to value the first two coupon payments. Their present values are $1.5/(1.01)$ and $1.5/(1.015)^2$. Removing those known present values from 97.14 leaves approximately 94.20 as the present value attributable to the final 101.50 payment. Therefore, the 18-month discount factor satisfies $94.20 = 101.50/(1+r/2)^3$. Solving for the nominal annual spot rate, r, gives approximately 0.0503, or 5.03%. This is the standard bootstrapping principle: derive a later-maturity zero rate after stripping out cash flows discounted using already known earlier spot rates. See the CFA Institute fixed-income valuation refresher and the NYU Stern overview of bootstrapping spot rates.

QUESTION NO: 4

A non-dividend-paying stock is trading at $100. The one-year risk-free interest rate is 5%, and a one-year futures contract on the stock is trading at $110. Ignoring transaction costs and assuming annual compounding, which arbitrage strategy is appropriate?

A. Borrow $100, buy the stock, and sell the futures contract

B. Lend $100, sell the stock short, and buy the futures contract

C. Buy both the stock and the futures contract

D. Sell both the stock and the futures contract

ANSWER: A

Explanation:

Borrow $100, buy the stock, and sell the futures contract is correct. The no-arbitrage futures price is $100 × 1.05 = $105. Since the observed futures price of $110 exceeds this fair value, the futures contract is overpriced relative to the cash-and-carry position.

An arbitrageur can borrow $100, purchase the stock, and short the futures contract at $110. At maturity, the stock is delivered into the futures contract for $110, while the borrowing is repaid at $105. The locked-in profit is $5, before transaction costs. Buying the futures and shorting the stock would be appropriate only if the futures contract were underpriced.

QUESTION NO: 5

If r be the yield of a bond, which of the following relationships is true:

A. - Modified Duration / (1 + r) = Macaulay Duration

B. - Modified Duration x (1 + r) = Macaulay Duration

C. Modified Duration x (1 + r) = Macaulay Duration

D. Modified Duration / (1 + r) = Macaulay Duration

ANSWER: C

Explanation:

The relationship **Modified Duration x (1 + r) = Macaulay Duration** is correct when *r* is the yield per compounding period. Macaulay duration is the present-value-weighted average time until a bond's promised cash flows are received. Modified duration converts that time-based measure into a measure of sensitivity of the bond price to a small change in yield. Under periodic compounding, modified duration equals Macaulay duration divided by one plus the periodic yield: Modified Duration = Macaulay Duration / (1 + r). Rearranging this equation gives Modified Duration x (1 + r) = Macaulay Duration.

This adjustment is necessary because a change in yield affects the discount factors used to value cash flows, not merely the calendar timing of those cash flows. Modified duration therefore provides the standard first-order approximation for percentage price sensitivity: a small yield increase of Δr produces an approximate percentage price change of −Modified Duration x Δr. The yield and duration convention must use consistent periods; for example, a semiannual yield requires the yield per half-year in the denominator. For further discussion of the duration measures and their relationship, see Corporate Finance Institute's modified-duration overview and Investopedia's Macaulay-duration reference.

QUESTION NO: 6

The yield offered by a bond with 18 months remaining to maturity is 5%. The coupon is 3%, paid semi-annually, and there are two more coupon payments to go in addition to the interest payment made at maturity. What is the bond's price?

A. $100

B. $99.07

C. $102.91

D. $97.14

ANSWER: D

Explanation:

The bond's price is **$97.14**, assuming the conventional $100 par value and that the quoted 5% yield to maturity is compounded semi-annually, consistent with the semi-annual coupon convention. A 3% annual coupon on $100 produces a $1.50 coupon every six months. With 18 months remaining, the cash-flow timeline consists of $1.50 in six months, $1.50 in 12 months, and $101.50 at maturity in 18 months (the final coupon plus return of principal). The semi-annual discount rate is 5% ÷ 2 = 2.5%. Thus, the bond value is calculated as: $1.50/(1.025) + $1.50/(1.025)^2 + $101.50/(1.025)^3 = $97.14, rounded to the nearest cent. This is the standard present-value approach to fixed-rate bond valuation: each promised cash flow is discounted at the yield rate applicable to its payment period and then summed. See the bond valuation discussion in OpenStax, Bond Valuation and the yield-to-maturity overview from Investopedia.

QUESTION NO: 7

A bank sells an interest rate swap to its client, with the client agreeing to pay the bank a fixed 4% and receive 3 month LIBOR + 100 basis points, payments due every quarter. After quarter 1, the 3 month LIBOR is 2% pa. Which of the following payments will happen in respect of this swap, assuming the contract notional is $100m, and the rate convention is 30/360.

A. Bank pays customer $1,000,000 and customer pays the bank $750,000

B. Bank pays customer $250,000

C. Customer pays bank $250,000

D. Bank pays customer $1,000,000

ANSWER: C

Explanation:

Customer pays bank $250,000 is correct. Under the swap, the client's fixed-rate obligation for the quarterly accrual period is 4% × (90/360) × $100 million = $1,000,000. The floating rate received by the client is three-month LIBOR plus 100 basis points. With LIBOR at 2% per annum, the applicable floating rate is 3% per annum, producing a quarterly amount of 3% × (90/360) × $100 million = $750,000. Standard plain-vanilla interest-rate swaps generally settle on a net basis when both payment legs are in the same currency and are due on the same date. Consequently, the fixed amount owed by the customer is offset against the floating amount owed by the bank. The net settlement is therefore $1,000,000 − $750,000 = $250,000, payable by the customer to the bank. The 30/360 convention makes the quarterly accrual fraction 90/360, or one quarter. This calculation reflects the basic swap cash-flow mechanics: each leg is determined from the notional, contractual rate, and day-count fraction, while the notional itself is not exchanged. See the ISDA Interest Rate Derivatives Definitions and the CME Group overview of interest-rate swaps.

QUESTION NO: 8

An investor enters into a 4 year interest rate swap with a bank, agreeing to pay a fixed rate of 4% on a notional of $100m in return for receiving LIBOR. What is the value of the swap to the investor two years hence, immediately after the net interest payments are exchanged? Assume the 2 year swap rate is 5%, and the yield curve is also flat at 5%

A. $1,859,410

B. $1,904,762

C. -$1,859,410

D. -$1,904,762

ANSWER: A

Explanation:

The correct value is **$1,859,410**. Two years after inception, there are two annual payment periods left. The investor's existing position is to pay a fixed 4% and receive LIBOR on a $100 million notional. At that date, a new two-year at-market swap would exchange LIBOR for a fixed 5% rate. The investor can conceptually offset the floating-rate exposure by entering an opposite new swap: pay LIBOR and receive fixed at 5%. Combining that offsetting swap with the original contract leaves a net fixed receipt of 1% per year, because the investor receives 5% and pays 4%. On the $100 million notional, this is $1 million at the end of each of the two remaining years. With a flat 5% yield curve, the value immediately after settlement is the present value of those two receipts: $\$1{,}000{,}000/1.05 + \$1{,}000{,}000/(1.05)^2 = \$1{,}859{,}410$. This offsetting-swap approach is consistent with the standard principle that an interest-rate swap's value reflects the present value of its remaining net cash flows. See CME Group's interest-rate swap overview and the ISDA Interest Rate Derivatives Definitions.

QUESTION NO: 9

An investor holds $1m in a 10 year bond that has a basis point value (or PV01) of 5 cents. She seeks to hedge it using a 30 year bond that has a BPV of 8 cents. How much of the 30 year bond should she buy or sell to hedge against parallel shifts in the yield curve?

A. Sell $1,600,000

B. Sell $625,000

C. Buy $1,000,000

D. Buy $1,600,000

ANSWER: B

Explanation:

Sell $625,000 is correct. A basis point value (BPV), also called PV01, measures the dollar change in a bond's value for a one-basis-point change in its yield. To hedge a long position in the 10-year bond against a parallel upward or downward yield shift, the investor must take an offsetting short position in the 30-year bond. Under the stated parallel-shift assumption, the yield beta is one, so the hedge is determined by equating the total BPV exposure of the two positions. The required hedge notional is therefore $1,000,000 multiplied by the ratio of the primary bond's BPV to the hedge bond's BPV: 5 cents divided by 8 cents. This produces a hedge notional of $625,000. Selling that amount of the 30-year bond gives the hedge position a BPV equal in magnitude and opposite in direction to the 10-year bond's BPV exposure. Consequently, small parallel yield movements will have approximately offsetting price effects on the two positions. This is a first-order, duration-based hedge; it neutralizes local PV01 exposure rather than all possible curve, convexity, or spread risks. See the PRMIA PRM certification overview and the CME Group's fixed-income education materials for related fixed-income risk concepts.

QUESTION NO: 10

Which of the following expressions represents the Treynor ratio, where μ is the expected return, σ is the standard deviation of returns, rm is the return of the market portfolio and rf is the risk free rate:

A)

$$\frac{\mu - r_f}{\beta}$$

B)

$$\frac{(\mu - r_f)}{\sigma}$$

C)

$$\frac{\sigma - \mu}{exp(r_f)}$$

D)

$$\mu - rf - \beta(r_m - r_f)$$

A. Option A

B. Option B

C. Option C

D. Option D

ANSWER: A

Explanation:

The Treynor ratio measures the excess expected return earned for each unit of systematic, market-related risk. Its expression is $(\mu - r_f) / \beta$, where μ is the portfolio's expected return, r_f is the risk-free rate, and β is the portfolio beta relative to the market. Accordingly, the correct displayed expression is the one that subtracts the risk-free rate from expected return and divides that excess return by beta.

Beta is used because the Treynor ratio is intended for evaluating a portfolio in the context of a well-diversified investor's holdings. Under diversification, idiosyncratic risk can largely be eliminated, so the relevant risk for performance evaluation is systematic risk—the sensitivity of portfolio returns to movements in the market. A higher Treynor ratio indicates that the portfolio delivers more expected excess return per unit of market risk assumed. This measure is therefore closely connected to the Capital Asset Pricing Model, in which beta determines the compensation required for exposure to market risk.

See the CFA Institute discussion of risk-adjusted performance measurement and the Treynor ratio definition and formula.

QUESTION NO: 11

If the CHF/USD spot and 3 month (91 days) forward rates are 1.1763 and 1.1652, what is the annualized forward premium or discount?

A. 3.73% premium

B. 0.94% premium

C. 0.94% discount

D. 3.785% discount

ANSWER: D

Explanation:

3.785% discount is correct. The annualized forward premium or discount is calculated from the proportional difference between the forward exchange rate and the spot exchange rate, annualized for the tenor: ((forward rate − spot rate) / spot rate) × (365 / days). Using the stated rates gives ((1.1652 − 1.1763) / 1.1763) × (365 / 91) = −0.03785, or approximately −3.785% per annum. The negative sign identifies the result as a discount rather than a premium: the quoted 91-day forward rate is below the current spot rate. Put differently, for this CHF/USD quotation convention, the currency represented by the numerator has a lower forward value relative to the quoted USD amount than it has at spot. Annualization makes the short-dated forward-point movement comparable with rates expressed on a yearly basis; it does not mean that the exchange rate itself will necessarily change by that amount over a full year. Foreign-exchange forward pricing and quotation conventions are discussed by the Bank for International Settlements and in the Foreign Exchange Committee's market guidance.

QUESTION NO: 12

A non-dividend-paying stock is trading at $100. A known cash dividend of $4 will be paid in six months. The continuously compounded risk-free rate is 5% per annum. What is the no-arbitrage one-year forward price, assuming the dividend is paid before the forward maturity?

A. $96.10

B. $100.00

C. $100.92

D. $105.13

ANSWER: C

Explanation:

The correct answer is **$100.92**. The prepaid forward value is the spot price less the present value of income received before maturity. The present value of the $4 dividend paid in six months is $4e^{-0.05\times0.5}$, or approximately $3.90. The one-year forward price is therefore $[100 - 3.90]e^{0.05}$, which is approximately $100.92.

The dividend reduces the forward price because an investor who buys and carries the stock receives that cash flow, whereas the holder of the forward does not. Using $100e^{0.05}$ would be appropriate only if no dividend were payable during the contract term.

QUESTION NO: 13

A pension fund has $100m in liabilities due in the future with an average modified duration of 20 years. The fund also holds a fixed income portfolio worth $125m with an average duration of 15 years. Which of the following approaches would be best suited for the pension fund to cover its interest rate risk?

A. Sell 15 year bond futures

B. Enter into an interest rate swap to receive fixed and pay floating

C. Enter into an interest rate swap to receive floating and pay fixed

D. The pension fund does not have any interest rate risk as assets more than adequately cover its liabilities

ANSWER: B

Explanation:

Enter into an interest rate swap to receive fixed and pay floating is correct because the pension fund's assets have less dollar duration than its liabilities. Dollar duration measures the approximate currency change in value for a specified yield movement. For a 1% interest-rate move, the $125 million asset portfolio with duration 15 has an approximate sensitivity of $18.75 million ($125m × 15 × 1%). The $100 million liability portfolio with duration 20 has an approximate sensitivity of $20 million. Thus, the fund is duration-short relative to its obligations: when rates fall, the present value of liabilities rises by more than the value of its assets.

A receive-fixed, pay-floating interest-rate swap has positive interest-rate duration, economically resembling a position that benefits when rates decline. Adding this exposure increases the fund's asset-side duration without requiring it to sell the existing portfolio. The swap can therefore be sized so that the total asset dollar duration more closely matches the liability dollar duration, reducing the net sensitivity of the funding position to parallel interest-rate changes. This is a standard liability-driven risk-management application of duration matching and swaps. See the PRM certification overview and the CME Group introduction to interest-rate swaps.

QUESTION NO: 14

When hedging one fixed income security with another, the hedge ratio is determined by:

A. The yield beta

B. The volatility of the hedge

C. Basis point value or PV01 of the two instruments

D. The yield beta and the basis point values of the hedge instrument and the security being hedged.

ANSWER: D

Explanation:

The yield beta and the basis point values of the hedge instrument and the security being hedged is correct. A fixed-income cross-hedge must first scale the hedge position so that its sensitivity to a small parallel yield movement offsets the sensitivity of the position being hedged. This sensitivity is commonly expressed as basis point value (BPV), dollar value of a basis point (DV01), or PV01: the approximate change in price resulting from a one-basis-point change in yield. The BPVs therefore determine the notional amount required to match interest-rate exposure.

Because the two securities can be located at different points on the yield curve, however, their yields may not move by the same amount. Yield beta captures the expected relationship between the yield change of the primary security and that of the hedge security. Incorporating this relationship adjusts the BPV-based notional ratio for the expected relative movement of the two yields. In simplified form, the hedge notional is based on the position BPV divided by the hedge BPV, multiplied by the applicable yield beta (with the sign chosen to offset the exposure). This produces a hedge designed to neutralize the relevant rate risk rather than merely match face values. See the PRM certification overview and the CME discussion of duration-based fixed-income hedging.

QUESTION NO: 15

A floating-rate note pays a market reference rate plus a fixed spread and resets its coupon every three months. Immediately after a reset date, assuming the issuer's credit spread is unchanged, its interest-rate duration is generally:

A. approximately equal to the legal maturity of the note

B. approximately equal to the time until the next reset date

C. zero because the coupon is floating

D. negative because coupon payments rise when rates rise

ANSWER: B

Explanation:

The correct answer is **approximately equal to the time until the next reset date**. A floating-rate note's coupon adjusts to prevailing market rates at the next reset. Consequently, most of the price impact of a change in market rates is offset when the coupon is reset, and the note's rate sensitivity is concentrated over the period until that reset.

The duration is therefore much shorter than the legal maturity of the note. It need not be exactly three months because accrued interest, reset conventions, caps or floors, and changes in credit spread can affect the precise sensitivity.

QUESTION NO: 16

Which of the following statements is INCORRECT according to CAPM:

A. expected returns on an asset will equal the risk free rate plus a compensation for the additional risk measured by the beta of the asset

B. the return expected by investors for holding the risky asset is a function of the covariance of the risky asset to the market portfolio

C. securities with a higher standard deviation of returns will have a higher expected return

D. portfolios on the efficient frontier have different Sharpe ratios

ANSWER: C

Explanation:

The statement *"securities with a higher standard deviation of returns will have a higher expected return"* is incorrect under the Capital Asset Pricing Model (CAPM). CAPM distinguishes between total risk and systematic, market-related risk. A security's standalone standard deviation measures total variability in its returns, including diversifiable, idiosyncratic risk. In a well-diversified portfolio, investors can eliminate this idiosyncratic component and therefore are not compensated for bearing it. Consequently, standard deviation by itself does not determine an asset's required or expected return under CAPM.

Instead, CAPM links expected return to beta, which measures the sensitivity of an asset's return to movements in the market portfolio. Beta is derived from the covariance of the asset's return with the market return, scaled by market variance. The model's central pricing relation is: expected return equals the risk-free rate plus beta multiplied by the market risk premium. Thus, an asset may have a high standalone standard deviation because of firm-specific uncertainty without having a correspondingly high expected return. This distinction between diversifiable total risk and priced systematic risk is fundamental to CAPM. See the CFA Institute discussion of portfolio risk and return and Investor.gov's overview of investment risk and diversification.

QUESTION NO: 17

The effectiveness of a hedge is determined by which of the following expressions, where $\rho\ x,y$ is the correlation between the asset being hedged and the hedge position:

A)

$1 - \rho_{x,y}^2$

B)

$\rho_{x,y}^2$

C)

$\sqrt{1 - \rho_{x,y}^2}$

D)

$\sqrt{1 + \rho_{x,y}^2}$

A. Option A

B. Option B

C. $\sqrt{(1 - \rho_{x,y}^2)}$

D. Option D

ANSWER: C

Explanation:

The expression $\sqrt{(1 - \rho_{x,y}^2)}$ is correct because it measures the residual risk of an optimally hedged position relative to the original unhedged risk. Under the minimum-variance hedge framework, the optimal hedge ratio is selected to minimize the variance of the combined spot and hedge position. After applying that hedge, the remaining variance is proportional to $1 - \rho_{x,y}^2$; therefore, the remaining standard deviation, or residual risk, is proportional to its square root. This shows why the correlation between the exposure and the hedging instrument is central to hedge effectiveness. When the absolute correlation is one, the residual-risk measure is zero, indicating that an ideal linear hedge can eliminate risk. As the absolute correlation declines, the residual risk rises, so the hedge becomes less effective. The standard deviations of the two positions are relevant when calculating the size of the minimum-variance hedge position, but they do not appear in this residual-risk effectiveness expression. The result follows directly from the standard minimum-variance hedge derivation used in derivatives and risk-management practice; see the CME Group overview of hedging with futures and the PRMIA PRM certification information.

QUESTION NO: 18

If the 1-year forward rates for years 1,2,3 and 4 are 2%, 3%, 4% and 5% respectively, what is the zero coupon spot rate for 4 years

A. 3.49%

B. 5%

C. 3.50%

D. 4%

ANSWER: A

Explanation:

The correct zero-coupon spot rate is **3.49%**. A four-year spot rate is the single annually compounded return that produces the same four-year accumulation factor as investing successively for each of the four one-year forward periods. Therefore, the relevant accumulation factor is the product of the annual forward-rate factors: (1.02)(1.03)(1.04)(1.05) = 1.1472552. The four-year zero-coupon spot rate, s, must satisfy $(1 + s)^4 = 1.1472552$. Taking the fourth root gives $s = 1.1472552^{1/4} - 1 = 0.03494$, or approximately 3.49% per annum. This is a geometric compounding calculation: each forward rate applies to a distinct one-year interval, and their associated growth factors must be chained together. The spot rate then annualizes that total compounded growth over the entire four-year horizon. This reflects the standard no-arbitrage relationship between forward rates and spot rates used in term-structure analysis. For background on spot and forward rates in the yield curve, see Investopedia: Forward Rate and Investopedia: Spot Rate.

QUESTION NO: 19

If the delta of a call option is 0.3, what is the delta of the corresponding put option?

A. 0.7

B. -0.7

C. -0.3

D. 0.3

ANSWER: B

Explanation:

For corresponding European call and put options—meaning that they have the same underlying asset, strike price, and expiration date—put-call parity gives the delta relationship $\Delta call - \Delta put = 1$ for a non-dividend-paying underlying. This follows by differentiating the standard parity equation, $C - P = S - Ke^{-rT}$, with respect to the underlying price. The stock price has delta 1 because a one-unit change in its price changes its value by one unit, while the present value of the fixed strike payment does not depend on the stock price and therefore has delta 0. Rearranging gives $\Delta put = \Delta call - 1$. With a call delta of 0.3, the corresponding put delta is therefore $0.3 - 1 = -0.7$. The negative value captures the put's inverse sensitivity to movements in the underlying: locally, an increase in the underlying price decreases the put's value. Put-call parity and its assumptions are summarized by Investopedia's put-call parity reference; delta as the sensitivity of an option value to the underlying price is described by Options Industry Council's delta overview.

QUESTION NO: 20

Which of the following does not explain the shape of an yield curve?

A. Market segmentation theory

B. The expectations hypothesis

C. The efficient markets hypothesis

D. The liquidity preference theory

ANSWER: C

Explanation:

The efficient markets hypothesis is the correct choice because it is a broad proposition about how quickly and fully security prices incorporate available information. In an efficient market, prices reflect relevant public information (and, depending on the form of efficiency, potentially other information sets), so investors should not consistently earn abnormal risk-adjusted returns using that information. This proposition concerns the informational efficiency of asset prices rather than providing a structural account of why yields differ across maturities at a given date. The shape of the yield curve—whether upward sloping, flat, or inverted—is instead addressed by term-structure theories that link maturity-specific yields to expected future short rates, liquidity or term premiums, and investor preferences across maturity segments. Efficient markets may be compatible with a yield curve that reflects available information, but the hypothesis itself does not specify the mechanism determining the curve's maturity pattern. This distinction is important in fixed-income analysis: market efficiency addresses information incorporation, whereas term-structure models explain relationships among interest rates at different maturities.

See the Federal Reserve's discussion of the yield curve at [Federal Reserve—Nominal Yield Curve] and the CFA Institute overview of market efficiency at [CFA Institute—Market Efficiency and Its Three Forms].

QUESTION NO: 21

Which of the following statements is true:

I. The maximum value of the delta of a call option can be infinity

II. The value of theta for a deep out of the money call approaches zero

III. The vega for a put option is negative

IV. For a at the money cash-or-nothing digital option, gamma approaches zero

A. I and IV

B. III only

C. II and III

D. II only

ANSWER: D

Explanation:

II only is correct. Theta measures the sensitivity of an option's value to the passage of time, conventionally holding the other pricing inputs constant. A deep out-of-the-money call has a very low probability of finishing in the money before expiry and consequently has very little remaining time value. As the call becomes increasingly far out of the money, its premium approaches zero; therefore, the amount by which its value changes for a small reduction in time to maturity also approaches zero. In other words, its theta tends toward zero (normally from the negative side under the standard market convention for long-option theta).

This conclusion follows directly from the Black-Scholes framework: the price of a non-dividend-paying European call is driven by the probability-weighted prospect of ending above the strike. When the underlying price is far below that strike relative to volatility and remaining time, the relevant normal-distribution terms become negligible. The time-decay component of the option price correspondingly becomes negligible as well. For background on theta and its interpretation as time decay, see Macroption: Option Theta. A mathematical presentation of the Black-Scholes model and its option sensitivities is available from QuantStart.