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Exam I: Finance Theory Financial Instruments Financial Markets - 2015 Edition

PRMIA 8006

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Topic Break Down

Topic	No. of Questions
Topic 1, Finance Theory	89
Topic 2, Financial Instruments	253
Topic 3, Financial Markets	46
Total	388

QUESTION NO: 1

Which of the following statements is true:

I. The OTC market for foreign exchange is much larger than the exchange traded futuresmarket for foreign currencies

II. DVP arrangements help avoid the risk of counterparty defaults on settlements

III. Exchanges offer the advantage of lower trading costs than ECNs

IV. ISDA master agreements form the basis of a large number of OTC derivative trades

A. I, II and III

B. II and IV

C. I, III and IV

D. I, II and IV

E. The OTC market for foreign exchange is much larger than the exchange traded futuresmarket for foreign currencies

II. DVP arrangements help avoid the risk of counterparty defaults on settlements

III. Exchanges offer the advantage of lower trading costs than ECNs

IV. ISDA master agreements form the basis of a large number of OTC derivative trades

ANSWER: D

Explanation:

The combination “I, II and IV” is correct. Foreign exchange is predominantly an over-the-counter market: banks, dealers, corporations, asset managers, and other institutions trade currencies bilaterally or through electronic dealer platforms in volumes that greatly exceed exchange-traded currency futures activity. The Bank for International Settlements’ Triennial Survey documents the enormous scale of global OTC foreign-exchange turnover: BIS Triennial Central Bank Survey.

Delivery-versus-payment arrangements link delivery of a security to the corresponding payment, so that delivery occurs only if payment occurs. This materially mitigates settlement principal risk and helps protect participants from loss arising when a counterparty fails during settlement. In practice, DVP is a core settlement-risk control used in securities-market infrastructures.

ISDA Master Agreements are also foundational documents for OTC derivatives. They provide a standardized contractual framework governing transactions between counterparties, including payment and delivery obligations, close-out netting, events of default, and collateral-related arrangements. Individual derivative confirmations are generally entered into under this overarching agreement, allowing parties to document many trades efficiently and consistently. ISDA describes the Master Agreement and its role in OTC derivatives documentation at ISDA Master Agreement.

QUESTION NO: 2

An equity portfolio manager desires to be 'market neutral'. His portfolio is valued at $10m and has a beta of 0.7 to the broad market index. The index is currently at 1000 and an index contract multiplier is specified as 250. What should he do to make the beta of his portfolio zero?

A. Sell 40 contracts of the index futures contract

B. Buy 28 contracts of the index futures contract

C. Buy 40 contracts of the index futures contract

D. Sell 28 contracts of the index futures contract

ANSWER: D

Explanation:

Sell 28 contracts of the index futures contract is correct. A beta-neutral hedge offsets the portfolio's systematic market exposure, rather than its full market value. The portfolio has a value of $10 million and a beta of 0.7, so its market-index-equivalent exposure is $10 million × 0.7 = $7 million. Since the equity portfolio has positive beta, the manager must take a short position in index futures to offset that positive market sensitivity.

Each index futures contract has a notional value equal to the index level multiplied by the contract multiplier: 1,000 × 250 = $250,000. Assuming the index futures position has a beta of approximately one relative to the stated broad market index, the required number of contracts is $7,000,000 ÷ $250,000 = 28. Selling, or shorting, 28 contracts creates approximately −$7 million of index exposure and reduces the combined portfolio beta to zero. This is the standard futures hedge-ratio approach: contracts = portfolio value × portfolio beta ÷ futures notional value. See CFA Institute's discussion of derivatives and hedging concepts at CFA Institute and CME Group's overview of equity index futures contract mechanics at CME Group.

QUESTION NO: 3

Using a single step binomial model, calculate the delta of a call option where future stock prices can take the values $102 and $98, and the call option payoff is $1 if the price goes up, and zero if the price goes down. Ignore interest.

A. 1/2

B. 1/4

C. 1/3

ANSWER: B

Explanation:

The correct delta is **1/4**. In a one-period binomial model, the option delta is the hedge ratio: the number of shares needed per option to replicate the change in the option's value across the two possible future states. It is calculated as the difference between the option values in the up and down states divided by the corresponding difference between stock prices.

Here, the call is worth $1 when the stock ends at $102 and $0 when the stock ends at $98. The stock-price change between the two states is therefore $102 − $98 = $4, while the option-value change is $1 − $0 = $1. Thus, delta equals $1/$4, or 0.25. Holding one quarter of a share for each call produces a $1 change in the hedge's stock value between the two terminal states, exactly matching the call's payoff change. Because interest is ignored, no discounting or risk-free borrowing adjustment is needed for this delta calculation. This is the standard replication-based approach used to value derivatives in the binomial framework; see PRMIA's PRM Certification overview and Investopedia's explanation of option delta.

QUESTION NO: 4

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:

$1,859,410 is the value to the investor immediately after the payment exchange at the end of year two. There are two annual payment periods remaining. Because the investor pays the contractual fixed rate of 4% and receives LIBOR, the position can be offset at the prevailing two-year swap rate by entering a new swap that receives fixed at 5% and pays LIBOR. The floating-rate receipts and payments then cancel, leaving the investor with a net fixed receipt of 1% per year on the $100 million notional for each of the two remaining years. Thus, the residual cash flows are $1 million at the end of each of years one and two from the valuation date. With the yield curve flat at 5%, their present value is $1,000,000/1.05 + $1,000,000/(1.05)^2 = $1,859,410 (rounded). The positive sign is appropriate because the original 4% fixed-paying swap has become beneficial when the market fixed swap rate is 5%: its below-market fixed payment obligation is valuable. This offsetting-swap method is equivalent to valuing the swap as the difference between the floating-rate and fixed-rate bond legs immediately after a reset/payment date. See the CME Group overview of interest-rate swaps and the ISDA Interest Rate Derivatives Definitions.

QUESTION NO: 5

For a forward contract on a commodity, an increase in carrying costs (all other factors remaining constant) has the effect of:

A. increasing the forward price

B. decreasing the forward price

C. increasing the spot price

D. decreasing the spot price

ANSWER: A

Explanation:

Increasing the forward price is correct. Under the commodity cost-of-carry relationship, the no-arbitrage forward price reflects the current spot price compounded at financing rates, plus applicable storage and insurance costs, offset by any benefits of physically holding the commodity, commonly expressed as convenience yield. In a simplified continuous-compounding form, this is written as $F_0,T = S_0e^{(r + u - y)T}$, where u represents carrying costs and y represents convenience yield. Holding the spot price, interest rates, convenience yield, and time to maturity constant, a higher carrying-cost component raises the cost of acquiring and maintaining the physical commodity until delivery. Consequently, the fair delivery price embedded in a forward contract must rise to prevent cash-and-carry arbitrage. Carrying costs are therefore a direct input to commodity forward valuation rather than an automatic change in the current spot-market price. This treatment is consistent with the standard cost-of-carry framework for commodities described in CFA Institute's discussion of forward commitments and the commodity forward-pricing overview from NYU Stern.

QUESTION NO: 6

An investor holds a portfolio of mortage backed securities valued at $100m. Using a Monte

Carlo based pricing model, he determines that the value of the portfolio would rise to $102m if interest rates were to fall by 45 basis points, and fall to $97m if interest rates were to rise by 45 basis points. What is the estimated modified duration of the investor's portfolio?

A. 5

B. 5.56

C. 11.12

D. None of the above

ANSWER: B

Explanation:

5.56 is the estimated modified duration. For a portfolio whose cash flows or embedded optionality make a standard analytical duration calculation impractical, duration can be estimated from model-generated price changes around the current interest-rate level. The central-difference estimate uses both shocked prices, which is particularly appropriate for mortgage-backed securities because their cash flows can change when rates change.

The portfolio price is estimated to move from $102 million at 45 basis points below the current rate to $97 million at 45 basis points above it. Thus, the total price decrease over the full yield interval is $5 million. Relative to the current $100 million value, this is a 5% price change. The yield interval between the two scenarios is 90 basis points, or 0.90%. Modified duration is the approximate percentage price sensitivity for a 1% (100-basis-point) change in yield, so it is calculated as 5% divided by 0.90%, which equals 5.56.

The negative relationship between price and yield is implicit in the duration convention; duration itself is reported as a positive sensitivity measure. This finite-difference approach is consistent with standard fixed-income treatment of effective duration for instruments with rate-sensitive cash flows. See the CFA Institute discussion of duration and convexity and the SEC Investor.gov overview of bond price and interest-rate risk.

QUESTION NO: 7

Which of the following cause convexity to increase:

I. Increase in yields

II. Increase in maturity

III. Increase in coupon rate

IV. Increase in duration

A. I and III

B. I and IV

C. II, III and IV

D. II and IV

E. Increase in yields

II. Increase in maturity

III. Increase in coupon rate

IV. Increase in duration

ANSWER: D

Explanation:

II and IV is correct. For a standard option-free, fixed-coupon bond, convexity reflects the curvature in the bond price–yield relationship and is generally greater when more of the bond's cash flows occur further in the future. Increasing maturity pushes the final principal payment, and typically a larger portion of the present-value sensitivity, further out in time. This makes the bond's price response to yield changes more curved and therefore raises convexity.

Duration and convexity are closely related measures of interest-rate sensitivity. Duration measures the first-order, or slope, component of price sensitivity, whereas convexity measures the second-order curvature component. Holding the relevant bond characteristics and cash-flow structure in view, a bond with greater duration will generally also have greater convexity because its cash flows are more time-sensitive to changes in discount rates. Thus, an increase in duration is associated with an increase in convexity. This relationship is especially useful when comparing otherwise similar conventional fixed-income instruments. The CFA Institute's fixed-income curriculum describes duration and convexity as the first- and second-order measures used to estimate price changes from yield movements: CFA Institute: Understanding Fixed-Income Risk and Return. See also the U.S. SEC's overview of bond price and interest-rate sensitivity: Investor.gov: Bonds or Bond Funds?

QUESTION NO: 8

Which of the following statements are true:

I. Forward prices for a stock will fall if dividend expectations increase for the period thecontract is alive

II. Three month forward prices will decline if the 10 year rate goes up, and short term ratesstay unchanged

III. Futures exchanges require buyers but not sellers to deposit initial margins

IV. Variation margin is to be deposited when a futures contract is entered into

V. Futures exchanges requires hedgers and speculators to deposit identical margins

VI. Interest rate futures contracts carry duration but no convexity due to the daily cashsettlements

A. I and IV

B. I

C. II and III

D. I, II, V and VI

E. Forward prices for a stock will fall if dividend expectations increase for the period thecontract is alive

II. Three month forward prices will decline if the 10 year rate goes up, and short term ratesstay unchanged

III. Futures exchanges require buyers but not sellers to deposit initial margins

IV. Variation margin is to be deposited when a futures contract is entered into

F. Futures exchanges requires hedgers and speculators to deposit identical margins

VI. Interest rate futures contracts carry duration but no convexity due to the daily cashsettlements

ANSWER: B

Explanation:

“I” is the only true statement. For a stock paying known discrete cash dividends during the life of a forward, the no-arbitrage forward price is determined by the spot price less the present value of dividends expected before maturity, grown at the applicable financing rate: $F_0 = (S_0 - PV(\text{dividends}))e^{rT}$. Equivalently, an investor can create the stock exposure needed for a forward by buying the stock today, financing that purchase, and receiving any dividends paid before maturity. Those expected dividend receipts reduce the net cost of carrying the stock to the forward date. Therefore, when expected dividends over the contract period increase, the present value of the income received by the stock holder rises and the fair delivery price on the forward falls, all else equal. This relationship is a central application of the cost-of-carry and cash-and-carry arbitrage framework used for equity forwards. The result applies whether dividends are modeled as specified cash payments or, in a continuous-yield formulation, as a higher dividend yield: $F_0 = S_0e^{(r-q)T}$, where an increase in q lowers the forward price. See the CME Group overview of futures pricing and Investopedia’s cost-of-carry reference.

QUESTION NO: 9

What is the day count convention used for US government bonds?

A. Actual/360

B. Actual/Actual

C. Actual/365

D. 30/360

ANSWER: B

Explanation:

Actual/Actual is the standard day-count convention for U.S. Treasury notes and bonds. Under this convention, accrued interest reflects the actual number of calendar days in the relevant accrual period, while the denominator reflects the actual number of days in the applicable coupon period or coupon year. This is especially appropriate for Treasury securities because coupon periods can include leap years and have differing numbers of days; using actual calendar-day counts ensures that interest accrual is aligned with the security's stated semiannual coupon schedule.

In market practice, the convention is commonly described as Actual/Actual for U.S. government bonds, with the precise calculation following the established Treasury-market convention for coupon-bearing securities. A purchaser between coupon dates compensates the seller for interest accrued from the prior coupon date through settlement, calculated using this actual-day methodology. This convention is fundamental to clean-price, dirty-price, accrued-interest, yield, and settlement calculations for Treasury notes and bonds. Treasury securities are issued and administered under Treasury regulations, while market calculation conventions are documented in industry reference materials such as SIFMA's securities calculation standards. See the U.S. Treasury auction regulations and SIFMA Standard Securities Calculation Methods.

QUESTION NO: 10

Which of the following will have the effect of increasing the duration of a bond, all else remaining equal:

I. Increase in bond coupon

II. Increase in bond yield

III. Decrease in coupon frequency

IV. Increase in bond maturity

A. III and IV

B. I and III

C. I and II

D. II, III and IV

E. Increase in bond coupon

II. Increase in bond yield

III. Decrease in coupon frequency

IV. Increase in bond maturity

ANSWER: A

Explanation:

"III and IV" is correct because both changes shift the bond's present-value-weighted cash flows farther into the future, increasing Macaulay duration when other relevant inputs remain fixed. Duration is the weighted average time until a bondholder receives the bond's cash flows, with each cash flow weighted by its present value. Reducing coupon frequency means that coupon payments are received less often—for example, annually rather than semiannually—so cash flows that would otherwise be received earlier are deferred. This increases the average timing of the payments and therefore raises duration.

Increasing maturity also increases duration because it extends the date on which principal is repaid and, where applicable, adds or shifts coupon cash flows further into the future. The maturity payment is generally a substantial component of a plain-vanilla bond's value, so moving it later increases the time-weighted average receipt date. Duration is consequently higher, indicating greater sensitivity of the bond's price to a given change in yield. This relationship is fundamental to fixed-income interest-rate risk measurement and is consistent with standard duration definitions and bond-price sensitivity treatment. See the CFA Institute's Fixed-Income Analysis refresher and the NYU Stern valuation resources.

QUESTION NO: 11

Which of the following statements are true:

I. A deep in-the-money call option has a value very close to that of a forward contract with a forward price equal to the exercise price

II. If the volatility of a stock goes down to zero, the value of a call option on the stock will tend to be close to that of a forward contract so long as the option is in the money.

III. All other things remaining the same, the issue of stock warrants exercisable at a future date will cause a decline in the current stock price

IV. Implied volatilities are calculated from market prices of options and are forward looking

A. I and IV

B. II and III

C. III and IV

D. All of the above

ANSWER: D

Explanation:

All of the above is correct. A deep in-the-money call has an extremely small probability of expiring worthless. Its value therefore approaches the value of acquiring the underlying at the strike at expiry: in the standard no-dividend setting, this is approximately spot price less the present value of the exercise price, which is also the value of a long forward with delivery price equal to that exercise price. The same limiting logic applies when volatility tends to zero. The terminal stock price becomes effectively deterministic under the model; where exercise is economically beneficial, the call approaches its corresponding forward-style payoff value.

Warrants create a potential claim for newly issued shares. When exercised in the money, the additional shares dilute existing equity interests. That expected dilution is incorporated into valuation when the warrants are issued, reducing the value attributable to each currently outstanding share, all else equal. This is the economic dilution effect associated with warrants; the U.S. SEC discusses warrants as securities that give holders rights to buy shares at a specified price in its investor glossary.

Finally, implied volatility is the volatility input backed out by equating an option-pricing model to an observed option market price. Since option prices reflect market participants' pricing of future uncertainty over the remaining option life, implied volatility is a forward-looking measure. The Cboe VIX FAQ similarly describes implied volatility as an expectation of future volatility derived from option prices.

QUESTION NO: 12

[According to the PRMIA study guide for Exam 1, Simple Exotics and Convertible Bonds have been excluded from the syllabus. You may choose to ignore this question. It appears here solely because the Handbook continues to have these chapters.]

Which of the following statements relating to convertible debt are true:

I. A hard call protection means the bond cannot be called by the issuer till the share pricereaches a threshold

II. It is advantageous for the issuer to call its convertible securities when the share priceexceeds the conversion price

III. When the issuer's share prices is very high, the convertible bond trades at a discount tothe value of the shares it is convertible into

IV. Convertible bonds generally have to carry a higher coupon than on equivalent non-convertible securities to make them attractive to investors

A. III and IV

B. I and II

C. I, III and IV

D. II and III

E. A hard call protection means the bond cannot be called by the issuer till the share pricereaches a threshold

II. It is advantageous for the issuer to call its convertible securities when the share priceexceeds the conversion price

III. When the issuer's share prices is very high, the convertible bond trades at a discount tothe value of the shares it is convertible into

IV. Convertible bonds generally have to carry a higher coupon than on equivalent non-convertible securities to make them attractive to investors

ANSWER: D

Explanation:

The combination “II and III” is correct. Once the share price is above the conversion price, the conversion feature is in the money. If the issuer has the contractual right to call the bond, calling it can force investors to elect conversion rather than accept the call redemption amount. This removes the convertible debt from the issuer’s balance sheet and results in equity issuance at the pre-agreed conversion terms. Consequently, an issuer has a meaningful economic incentive to call an in-the-money convertible, subject to the bond’s call provisions and notice requirements.

When the issuer’s share price becomes very high, the convertible’s value is strongly linked to the value of the shares obtainable upon conversion. However, the issuer’s ability to call the bond limits the time during which the holder can retain the convertible’s additional contractual features. A likely call and the resulting forced conversion or redemption constrain the security’s value relative to the unrestricted value of the underlying shares. Thus, in this setting, the convertible may trade below the direct value of the shares into which it can be converted. The distinction between hard call protection, which is time-based, and price-contingent soft-call protection is important in assessing when this issuer action is available. See NYU Stern’s discussion of convertible-bond valuation and call features in Aswath Damodaran’s valuation materials and the SEC example of convertible-note call and conversion provisions.

QUESTION NO: 13

A risk analyst working for an asset manager with a large debt portfolio is tasked with determining the suitability of using a traded debt ETF as a hedge against the value of the debt portfolio. He/she calculates the minimum variance hedge ratio to be exactly 1.0.

Given the above facts, which of the following statements are certainly true:

I. The ETF represents a perfect hedge for the portfolio

II. The volatility of the portfolio is the same as that for the ETF

III. The ETF cannot be used as an effective hedge for the debt portfolio

IV. None of the above

A. III only

B. I and II C. I only

C. IV only

D. The ETF represents a perfect hedge for the portfolio

II. The volatility of the portfolio is the same as that for the ETF

III. The ETF cannot be used as an effective hedge for the debt portfolio

IV. None of the above

ANSWER: C

Explanation:

"IV only" is correct because a minimum-variance hedge ratio of 1.0, by itself, does not establish any of the stated conclusions about perfection, equal volatility, or ineffectiveness. For a portfolio return P hedged with an ETF return H, the minimum-variance hedge ratio is h* = Cov(P,H) / Var(H), equivalently rho(P,H) × sigma(P) / sigma(H). A value of 1.0 means that the covariance between the portfolio and ETF equals the ETF variance; it does not separately identify either the correlation or the relative volatilities.

Consequently, the portfolio and ETF need not have identical volatility. Nor does a one-for-one hedge ratio prove a perfect hedge. A perfect variance-eliminating hedge requires the relevant return exposures to move together with perfect correlation, together with the appropriate hedge position and scaling. Conversely, the ratio alone cannot establish that the ETF is ineffective: hedge effectiveness depends critically on the strength and stability of correlation, as well as basis risk and exposure matching. Thus, without further information about correlation and the underlying portfolio and ETF risk characteristics, no statement among the first three is certain. The hedge-ratio relationship follows the standard minimum-variance hedging framework described by NYU Stern and in the CME Group hedging overview.

QUESTION NO: 14

If σx is the standard deviation of the asset to be hedged, and σy is the standard deviation of the asset being used to hedge against price movements in *x*, then the minimum variance hedge ratio is given by which of the following expressions (given that $\rho x,y$ is their correlation)

A)

B)

C)

D)

A. Option A

B. Option B

C. Option C

D. Option D

E. $h^* = \rho_{x,y} \times (\sigma_x/\sigma_y)$

ANSWER: E

Explanation:

The minimum-variance hedge ratio is $h^* = \rho_{x,y}(\sigma_x/\sigma_y)$. It is obtained by minimizing the variance of the hedged position, whose return can be written as the return on the exposure being hedged less the hedge ratio times the return on the hedging asset. Differentiating that variance with respect to the hedge ratio gives $h^* = \mathrm{Cov}(x,y)/\mathrm{Var}(y)$. Since covariance equals correlation times the two standard deviations, $\mathrm{Cov}(x,y) = \rho_{x,y}\sigma_x\sigma_y$, and $\mathrm{Var}(y) = \sigma_y^2$, the expression simplifies to $\rho_{x,y}\sigma_x/\sigma_y$.

This ratio properly scales the hedge for both co-movement and relative volatility. For example, with perfect positive correlation, an exposure with half the volatility of the hedging asset requires a hedge ratio of one-half to offset its price variability. The same result is also interpretable as the regression beta of the hedged asset's return on the hedging asset's return. See the hedge-ratio overview at Wikipedia: Hedge ratio and PRMIA's professional risk-management resources at PRMIA.

QUESTION NO: 15

Which of the following is an example of a multifactor model explaining expected asset returns:

I. Arbitrage pricing theory

II. Single index model

III. Capital asset pricing model

A. I

B. II

C. III

D. II and III

ANSWER: A

Explanation:

The correct answer is *I*. Arbitrage Pricing Theory is a multifactor asset-pricing framework: it represents an asset's expected return as compensation for exposure to multiple systematic risk factors. The theory does not require the factors to be limited to one market portfolio; instead, relevant common drivers may include variables associated with macroeconomic conditions, such as changes in inflation, interest rates, industrial production, or economic-growth expectations. In its standard linear form, expected excess return depends on the asset's sensitivities (factor betas) to the systematic factors and the risk premia associated with those factors. The no-arbitrage principle is central: if assets with equivalent factor exposures had inconsistent expected returns, an arbitrage portfolio could in principle be constructed, pushing prices toward a relationship consistent with factor pricing. This flexible multiple-factor structure makes Arbitrage Pricing Theory an example of a multifactor model for expected asset returns. A useful academic overview of the theory is available from Stephen Ross's original Arbitrage Theory of Capital Asset Pricing article. For the broader empirical factor-model context used in modern asset pricing, see Kenneth R. French's Data Library.

QUESTION NO: 16

If the zero coupon spot rate for 3 years is 5% and the same rate for 2 years is 4%, what is the forward rate from year 2 to year 3?

A. 1%

B. 2.03%

C. 4.5%

D. 7.03%

ANSWER: D

Explanation:

7.03% is correct, assuming the convention implicit in the question: annually compounded zero-coupon spot rates. A spot rate gives the annualized return for investing from today to a stated maturity. The one-year forward rate beginning at the end of year 2 must make an investment over years 2 through 3 economically equivalent to investing from today through year 3, after first investing from today through year 2. Accordingly, no-arbitrage requires $(1 + s_3)^3 = (1 + s_2)^2(1 + f_{2,3})$. Substituting the given spot rates produces $f_{2,3} = (1.05)^3 / (1.04)^2 - 1$. This equals approximately 0.07029, or 7.03% when expressed as a percentage and rounded to two decimal places. The forward rate is therefore higher than both quoted spot rates because it is the implied one-year rate needed in the final year for the three-year compounded return to equal the return indicated by the three-year spot rate. This relationship is the standard bootstrapping/no-arbitrage link between discount factors, spot rates, and forward rates. See the Federal Reserve's discussion of the yield curve and implied future rates and the CFA Institute's overview of fixed-income markets.

QUESTION NO: 17

Which of the following statements are true:

I. ______ The swap rate, also called the swap spread, is initially calculated so that the value of theswap at inception is zero.

II. The value of a swap at initiation is different from zero and is equal to the differencebetween the NPV of the cash flows of the two legs of the swap

III. OTC swaps are standardized and limited to a defined set of standard contracts

IV. Interest rate and commodity swaps are the types of swaps that are most traded

A. I, II and IV

B. II and III

C. I and IV

D. II, III and IV

E. The swap rate, also called the swap spread, is initially calculated so that the value of theswap at inception is zero.

II. The value of a swap at initiation is different from zero and is equal to the differencebetween the NPV of the cash flows of the two legs of the swap

III. OTC swaps are standardized and limited to a defined set of standard contracts

IV. Interest rate and commodity swaps are the types of swaps that are most traded

ANSWER: C

Explanation:

I and IV is the correct selection under the terminology and market classification used in this question. A newly entered plain-vanilla swap is priced at the par swap rate: the fixed rate is set so that the present value of the fixed-leg payments equals the present value of the floating-leg payments. Consequently, the two legs offset at trade inception and the swap has a value of zero to both counterparties, before allowing for such items as bid–offer costs, credit adjustments, collateral effects, or subsequent market movements. This zero-value condition is the fundamental no-arbitrage pricing convention for an at-market swap. The fixed rate is obtained from the relevant discount factors and forward rates over the contract's payment dates, rather than being chosen independently of those market inputs. Interest-rate swaps are the central swap-market product, and commodity swaps are also an established OTC swap category used to exchange fixed and floating commodity-price exposures. ISDA's educational materials describe swaps as agreements to exchange cash flows and explain their role in managing interest-rate and other market risks. See ISDA's SwapsInfo booklet and the CME Group introduction to interest-rate swaps.

QUESTION NO: 18

If , and represent the delta, gamma and theta of any derivative whose value is V; r be the risk free rate; be the volatility and S the spot price of the underlying, which of the following equations will hold true? (Note that is the notation used for partial derivatives)

I. 202.21.q1

II. 202.21.q2

III. 202.21.q3

IV. 202.21.q4

A. III and IV

B. II

C. I and II

D. III

E. 202.21.q1

II. 202.21.q2

III. 202.21.q3

IV. 202.21.q4

ANSWER: C

Explanation:

The correct selection is **I and II**. These are equivalent representations of the Black–Scholes–Merton partial differential equation, expressed using derivative sensitivities. For a derivative value *V(S,t)*, delta is the first partial derivative of value with respect to spot, gamma is the second partial derivative with respect to spot, and theta is the partial derivative with respect to time. Under the standard Black–Scholes assumptions, the no-arbitrage condition gives the fundamental relationship: $\theta + \frac{1}{2}\sigma^2 S^2 \Gamma + rS\Delta - rV = 0$. Rearranging this same identity produces an alternative form, so both stated equations can hold simultaneously rather than being competing formulae.

The key intuition is that a continuously rebalanced hedge eliminates the instantaneous random component of the derivative's price movement. The resulting riskless position must earn the risk-free rate; otherwise an arbitrage opportunity would exist. This condition yields the PDE and applies broadly to contingent claims whose value depends on the underlying spot price and time, subject to the model assumptions. The PDE is the foundation from which the standard European-option valuation formula is obtained. See the Black–Scholes equation overview and QuantStart's derivation of the Black–Scholes equation.

QUESTION NO: 19

For a deep in-the-money option:

A. Delta approaches 1 and gamma approaches 1

B. Delta approaches 1 and gamma approaches 0

C. Delta approaches 0 and gamma approaches 1

D. Delta approaches 1 and gamma approaches

ANSWER: B

Explanation:

"Delta approaches 1 and gamma approaches 0" is correct for a deep in-the-money call option. Delta measures the sensitivity of the option's value to a small change in the underlying asset price. Once a call is far in the money, its payoff is dominated by intrinsic value: its value behaves approximately as the underlying price less the present value of the strike. Consequently, a one-unit increase in the underlying price produces approximately a one-unit increase in the call's value, so delta converges to one.

Gamma is the rate at which delta changes as the underlying price changes. Since the delta of a deeply in-the-money call is already very close to one and changes very little for additional movements in the underlying, gamma converges to zero. This reflects the fact that the option has little remaining uncertainty regarding exercise and therefore behaves increasingly like a linear position in the underlying asset. The same limiting logic applies to a deeply in-the-money put with the appropriate delta sign: its absolute delta approaches one while gamma approaches zero. For definitions and discussion of option Greeks, see the Options Industry Council's Greeks overview and CME Group's explanation of gamma.

QUESTION NO: 20

Which of the following statements is true for a Credit Linked Note (CLN)?

A. The CLN will yield the risk free rate

B. If a credit default occurs, the investors will get their full money back

C. The investor in the note is the protection buyer

D. The investor in the note is the protection seller

ANSWER: D

Explanation:

The statement *"The investor in the note is the protection seller"* is correct because a credit-linked note is a funded credit derivative that transfers the credit risk of a reference entity from the note issuer or protection buyer to the note investor. The investor pays the note's principal up front and, economically, provides credit protection in exchange for an enhanced coupon. That coupon generally incorporates a base interest-rate component and compensation for assuming the reference credit risk, analogous to the premium earned by a credit default swap protection seller.

If a credit event specified in the CLN documentation occurs, the principal repayment is reduced according to the contractual settlement terms. The issuer uses the funded principal, in whole or in part, to meet the credit-protection payment obligation. Thus, the investor bears the loss associated with the referenced credit event and is appropriately characterized as the protection seller. The funded structure distinguishes a CLN from an unfunded CDS: collateral is embedded in the note through the investor's initial principal payment. The Bank for International Settlements describes credit-linked notes as instruments combining a debt security with credit-derivative features: BIS Quarterly Review. See also the ISDA overview of credit derivatives: ISDA Credit Derivatives Definitions.

QUESTION NO: 21

[According to the PRMIA study guide for Exam 1, Simple Exotics and Convertible Bonds have been excluded from the syllabus. You may choose to ignore this question. It appears here solely because the Handbook continues to have these chapters.]

What is the current conversion premium for a convertible bond where $100 in market value of the bond is convertible into two shares and the current share price is $50?

A. 0.5

B. 1

C. 0

D. None of the above

ANSWER: C

Explanation:

The correct answer is **0**. A convertible bond's conversion premium measures how much more the bond's market value is than the current market value of the shares received on conversion, usually expressed relative to that share value. Here, a bond worth $100 converts into two shares. At a current share price of $50, the conversion value is 2 × $50 = $100. The conversion price is likewise $100 ÷ 2 = $50 per share, exactly equal to the current share price. Therefore, the bond has no amount above its immediate conversion value: ($100 − $100) ÷ $100 = 0. The current conversion premium is consequently zero, or 0% if stated as a percentage. This is the at-par conversion case: an investor exchanging the bond for shares would receive shares whose current market value equals the bond's stated market value. Definitions of conversion value and conversion premium are discussed in the U.S. SEC Investor Bulletin on convertible securities and in the CFA Institute's convertible bonds refresher reading.

QUESTION NO: 22

Which of the following statements are true:

I. For a delta neutral portfolio, gamma and theta carry opposite signs

II. The sum of the absolute value of gamma for a call and a put for the same option is 1

III. A large positive gamma is desirable in a delta neutral portfolio

IV. A trader needs at least two separate tradeable options to simultaneously make aportfolio both gamma and vega neutral

A. II and IV

B. I and II

C. III and IV

D. I, III and IV

E. For a delta neutral portfolio, gamma and theta carry opposite signs

II. The sum of the absolute value of gamma for a call and a put for the same option is 1

III. A large positive gamma is desirable in a delta neutral portfolio

IV. A trader needs at least two separate tradeable options to simultaneously make aportfolio both gamma and vega neutral

ANSWER: D

Explanation:

I, III and IV is correct. In the standard Black–Scholes framework, a delta-neutral option portfolio has no first-order exposure to a small underlying-price movement. Its remaining local price behavior is therefore governed primarily by gamma, time decay, and financing terms. The Black–Scholes pricing relation shows the usual trade-off: a positive-gamma position generally has negative theta, whereas a negative-gamma position generally has positive theta, assuming the standard market conditions underlying this approximation. This is the familiar cost of holding convexity.

Positive gamma is desirable for a delta-neutral trader because it produces convex exposure: after the underlying rises, the position becomes directionally long, and after it falls, it becomes directionally short. With active delta rebalancing, this convexity can allow gains from sufficiently large realized movements in either direction. CME's discussion of gamma explains this curvature property and its role in changing delta: CME Group, Options Gamma.

Finally, gamma and vega are separate option sensitivities. Simultaneously setting both aggregate exposures to zero normally requires two independently selectable option positions, so that the trader can solve two hedge equations; the underlying instrument can then be used to restore delta neutrality. This multi-instrument hedging approach is consistent with the Greeks framework described by CME Group, Option Greeks.

QUESTION NO: 23

Which of the following statements are true:

I. Forward prices for a stock will fall if dividend expectations increase for the period the contract is alive

II. Three month forward prices will decline if the 10 year rate goes up, and short term rates stay unchanged

III. Futures exchanges require buyers but not sellers to deposit initial margins

IV. Variation margin is to be deposited when a futures contract is entered into

V. Futures exchanges requires hedgers and speculators to deposit identical margins

VI. Interest rate futures contracts carry duration but no convexity due to the daily cash settlements

A. I and IV

B. I

C. II and III

D. I, II, V and VI

ANSWER: B

Explanation:

I is the only true statement. For a stock forward contract, the no-arbitrage forward price reflects the spot price compounded at the relevant financing rate, less the value of cash dividends expected to be received by the stockholder during the life of the contract. A forward buyer does not own the shares before delivery and therefore does not receive those dividends. Consequently, expected dividends are an economic benefit of holding the underlying stock that must be deducted from the stock's carrying cost. Holding the spot price, contract maturity, and relevant financing rate constant, an increase in expected dividends increases the present value of income forgone by the forward buyer. This lowers the fair delivery price of the forward contract. In the common discrete-dividend formulation, the relationship is expressed as F_0=(S_0-PV(dividends))e^{rT}; hence a higher present value of dividends produces a lower forward price. This result follows directly from cash-and-carry arbitrage: an investor comparing stock ownership funded by borrowing with a forward position must account for dividends received while the stock is held. See the CFA Institute's overview of derivative markets and instruments and NYU Stern's forward-pricing discussion.

QUESTION NO: 24

The LIBOR square swap offers the square of the interest rate change between contract inception and settlement date. If LIBOR at inception is y, and upon settlement is x, the contract pays (x - y)2 for x > y; and -(x - y)2 for x < y.

What of the following cannot be a value of the gamma of this contract?

A. -2

B. 1

C. 2

D. 0

ANSWER: B

Explanation:

The value **1** cannot be the gamma of the LIBOR square swap. Gamma is the second derivative of the contract value with respect to the underlying interest-rate level, here represented by *x*. This follows the standard risk-management interpretation of gamma as the rate of change of delta; see the PRMIA Risk Management Professional curriculum overview and the discussion of second derivatives in OpenStax Calculus.

For settlement rates above the inception rate, the payoff is $(x - y)^2$. Differentiating once gives delta of $2(x - y)$, and differentiating again gives gamma of 2. For settlement rates below the inception rate, the payoff is $-(x - y)^2$. Its first derivative is $-2(x - y)$, and its second derivative is -2. Under the convention used in this question, the payoff is zero when the two rates are equal and gamma is treated as zero at that point. Thus, the intended gamma values are -2, 0, and 2; the value 1 does not arise from either branch of the payoff function.

QUESTION NO: 25

Which of the following are valid credit enhancements used for credit derivatives:

I. Overcollateralization

II. Excess spread

III. Cash reserves

IV. Margin requirements

A. I, II and IV

B. II, III and IV

C. I, II and III

D. I, II, III and IV

E. Overcollateralization

II. Excess spread

III. Cash reserves

IV. Margin requirements

ANSWER: C

Explanation:

I, II and III is correct. These are standard forms of internal credit enhancement in structured-credit and securitization transactions, whose credit-risk exposures can also be transferred or referenced through credit derivatives. Overcollateralization exists when the value of the collateral pool exceeds the amount owed on the issued notes. The surplus provides a first buffer against defaults, prepayments, or collateral-value declines before investors in the rated notes experience principal loss. Excess spread is the residual difference between income generated by the receivables and the transaction's funding costs, fees, and losses. It can be trapped and applied to cover credit losses, thereby increasing protection for noteholders. Cash reserves are funded amounts held in a reserve account and available, subject to the deal documentation, to meet shortfalls or absorb losses. Together, these mechanisms increase the ability of a special-purpose vehicle to make promised payments despite deterioration in the underlying asset pool. The SEC's Regulation AB adopting release discusses credit enhancement and the disclosure of enhancement arrangements in asset-backed securities transactions; see SEC Release No. 33-8518. The OCC also describes subordination, overcollateralization, excess spread, and reserve accounts as structural protections in securitization; see the OCC Asset Securitization Comptroller's Handbook.

QUESTION NO: 26

Identify the underlying asset in a treasury bond futures contract?

A. Any long term US Treasury bond with a maturity of more than 15 years and not callable within 15 years

B. Any long term US Treasury note with a maturity between 6.5 years and 10 years from the date of delivery

C. Any long term US Treasury bond with a maturity of more than 10 years and not callable within 10 years

D. Any of the above, with the price adjusted with the coupon and maturity date of the bond delivered

ANSWER: A

Explanation:

Any long term US Treasury bond with a maturity of more than 15 years and not callable within 15 years is the correct deliverable underlying for the traditional Treasury bond futures contract described in the PRMIA curriculum. More precisely, the futures contract is based on a deliverable basket rather than one uniquely identified bond. Eligible securities are long-dated U.S. Treasury bonds that meet the contract's remaining-term and call-protection requirements at delivery. This eligibility framework gives the short futures position the right to select which qualifying Treasury bond to deliver.

Because eligible bonds can have different coupons and remaining maturities, the exchange applies a conversion factor to the invoice price for the bond actually delivered. The economically relevant delivery choice is commonly called the cheapest-to-deliver bond: it is the eligible security that minimizes the cost of satisfying the delivery obligation under prevailing market prices. Thus, the long maturity and non-callability conditions identify the contract's underlying deliverable asset class, while conversion-factor adjustments standardize delivery across the eligible bonds. CME Group’s contract specifications and delivery materials describe the deliverable-grade and conversion-factor mechanics for U.S. Treasury bond futures: CME Group Treasury Bond futures contract specifications and CME Group Treasury bond futures delivery information.

QUESTION NO: 27

Euro-dollar deposits refer to

A. A deposit denominated in the ECU

B. A US dollar deposit outside the US

C. A Euro deposit convertible into dollars upon maturity

D. A Euro deposit in the USA

ANSWER: B

Explanation:

Euro-dollar deposits refer to deposits denominated in U.S. dollars that are held at banks outside the United States. The name does not require that the deposit be located in Europe: “Eurodollar” is the conventional market term for offshore U.S.-dollar bank deposits, including those held in financial centres such as London, Singapore, or the Cayman Islands. Such deposits may be accepted by a non-U.S. bank or by a foreign branch of a U.S. bank. Their defining feature is therefore the combination of U.S.-dollar denomination and a location outside the United States, rather than the currency of the host country or conversion rights at maturity. Eurodollar deposits are an important component of the offshore wholesale funding market and historically provided the foundation for Eurodollar lending and related money-market instruments. The Bank for International Settlements describes international banking activity in terms of banks’ cross-border positions and offices outside the country where a banking group is headquartered, a framework relevant to offshore deposit markets. See the BIS international banking statistics overview and the Federal Reserve Bank of New York’s overview of the federal funds and Eurodollar markets.

QUESTION NO: 28

Which of the following is not a money market security

A. Treasury notes

B. Treasury bills

C. Bankers' acceptances

D. Commercial paper

ANSWER: A

Explanation:

Treasury notes are not money market securities because they are issued with original maturities longer than one year. In the United States, Treasury notes are marketable government debt instruments issued with terms of 2, 3, 5, 7, or 10 years. Although their remaining time to maturity can eventually fall below one year, their original issuance tenor places them in the capital-market rather than money-market category. Treasury notes pay a fixed coupon every six months and return principal at maturity, characteristics consistent with intermediate-term government financing.

Money markets conventionally comprise highly liquid debt instruments issued for short-term funding, generally with original maturities of one year or less. This maturity-based distinction is fundamental in finance theory because it separates short-term cash-management instruments from longer-term securities exposed to greater interest-rate risk. The U.S. Treasury describes notes as securities with maturities of two to ten years, while its Treasury bills have terms of one year or less. See the Treasury’s overview of Treasury bills and Treasury notes. Therefore, Treasury notes are the appropriate selection as the instrument that is not a money market security.

QUESTION NO: 29

[According to the PRMIA study guide for Exam 1, Simple Exotics and Convertible Bonds have been excluded from the syllabus. You may choose to ignore this question. It appears here solely because the Handbook continues to have these chapters.]

The use of numerical pricing methods over analytical methods for valuing exotic options is resorted to allow for which of the following reasons:

I. Efficient valuation

II. Allowing for stochastic volatility

III. Accommodating discontinuous asset prices

IV. Allowing for complex payoffs

A. I, II and III

B. II, III and IV

C. I, II, III and IV

D. I

ANSWER: B

Explanation:

II, III and IV is correct because numerical techniques are designed to value derivatives when the assumptions needed for a closed-form formula are relaxed or when the contract's payoff structure is too complicated for a tractable analytical solution. In particular, lattice, finite-difference, and Monte Carlo methods can model stochastic volatility by making volatility a state variable or by simulating its evolution jointly with the underlying asset. They can also incorporate discontinuous asset-price behavior, such as jumps, by specifying an appropriate jump-diffusion or other non-continuous process and evaluating the resulting price dynamics numerically. Finally, exotic contracts commonly contain path dependence, barriers, multiple observation dates, exercise features, or combinations of contingent payoff conditions. Numerical valuation provides a flexible framework for representing these contractual rules directly and calculating discounted expected payoffs under the chosen risk-neutral model. This flexibility is the central reason numerical methods are used for exotics: they extend valuation to realistic dynamics and payoff designs that are not readily captured by simple analytical formulas. For an overview of simulation-based derivative valuation, see MathWorks' Monte Carlo simulation documentation. Further technical context on option-pricing methods is available from Cambridge University Press's Option Pricing and Estimation of Financial Models.

QUESTION NO: 30

For a portfolio of equally weighted uncorrelated assets, which of the following is FALSE:

A. Returns can be averaged to get portfolio return

B. Asset variances can be combined using squared portfolio weights to obtain portfolio variance

C. Portfolio risk is less than if the assets were positively correlated

D. Standard deviations can be averaged together to obtain portfolio volatility

ANSWER: D

Explanation:

"Standard deviations can be averaged together to obtain portfolio volatility" is false. Portfolio volatility must be calculated from portfolio variance, and variance—not standard deviation—is the quantity that combines according to the portfolio-variance formula. For equally weighted assets with zero pairwise correlations, the covariance terms are zero, so the portfolio variance is the sum of each asset's variance multiplied by the square of its portfolio weight: $\sigma_p^2 = \Sigma w_i^2 \sigma_i^2$. With n equal weights, this becomes $(1/n^2)\Sigma\sigma_i^2$; portfolio volatility is then the square root of that result. Taking a simple arithmetic average of individual standard deviations ignores both the required squaring of weights and the nonlinear square-root transformation from variance to volatility. This distinction is fundamental to diversification: uncorrelated holdings reduce the portfolio's risk relative to a portfolio of the same assets with positive correlations. The portfolio return, by contrast, remains the weighted average of the individual asset returns. See the portfolio variance formulation in Investopedia's portfolio variance reference and the diversification discussion in CFA Institute's portfolio risk and return material.

QUESTION NO: 31

All else equal, a bond with a put option held by the investor should have:

A. A lower yield than an otherwise identical non-putable bond

B. A higher yield than an otherwise identical non-putable bond

C. The same yield as an otherwise identical non-putable bond

D. A yield that is independent of the embedded put option

ANSWER: A

Explanation:

The correct answer is **a lower yield than an otherwise identical non-putable bond**. A putable bond gives the investor the right to sell the bond back to the issuer at specified dates and prices. This right is valuable to the investor because it provides protection if market yields rise and the bond's market price falls.

Since the embedded put benefits the investor and is costly to the issuer, the investor should be willing to accept a lower required yield, or equivalently pay a higher price, than for an otherwise identical straight bond. A callable bond has the opposite allocation of value: the issuer owns the call right, so investors generally require a higher yield to compensate for that disadvantage.

QUESTION NO: 32

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 because an effective fixed-income hedge must match the interest-rate sensitivity of the position being hedged, while also allowing for potentially different yield movements between the two securities. Basis point value (BPV), commonly called PV01 or DV01, measures the approximate change in a security's value for a one-basis-point change in yield. Comparing the BPVs of the primary position and hedge instrument establishes the amount of hedge notional required to offset a given parallel yield move. Yield beta then adjusts this sensitivity-based quantity for the expected relationship between the yield change of the hedged instrument and that of the hedging instrument. Conceptually, the hedge ratio is proportional to the BPV of the exposure divided by the BPV of the hedge, with an adjustment for yield beta. This approach recognizes that two bonds may have distinct maturities, durations, coupons, liquidity characteristics, or sector exposures, so their yields need not move one-for-one. Duration is closely related to BPV: for a given price and yield level, greater duration generally means greater price sensitivity to interest-rate changes. The resulting ratio is therefore designed to neutralize the relevant expected rate-risk exposure, rather than merely equating notionals. See the PRM certification overview and CFA Institute's discussion of fixed-income risk and return.

QUESTION NO: 33

A treasury bond paying a 4% coupon is sold at a discount. Assume that the yield curve stays flat and constant over the next one year. The price of the bond one year hence can be expected to:

A. Decrease

B. Increase

C. Stay the same

D. Cannot be determined with the given information

ANSWER: B

Explanation:

Increase is correct. A bond selling at a discount has a price below its face (par) value. If the yield curve remains flat and unchanged over the coming year, the market-required yield for the bond's remaining cash flows does not change. As a result, the bond experiences the normal passage-of-time effect known as pull to par: with one year less remaining until redemption, its price moves toward the amount that will be repaid at maturity. Since the starting price is below par, that movement is upward.

This result can also be seen from present-value mechanics. After the next coupon is paid, the remaining coupons and principal are each one period closer to payment. Holding discount rates constant, shortening the time to those cash flows increases their present value. The bondholder also receives the scheduled 4% coupon during the year; the stated price effect refers to the bond's value after accounting for the normal reduction in remaining time to maturity, conventionally considered on an ex-coupon basis. U.S. Treasury notes and bonds pay stated interest periodically and repay principal at maturity, as described by TreasuryDirect's Treasury bonds overview. For a discussion of bond prices, yields, and the inverse valuation relationship, see the SEC Investor.gov bond guidance.

QUESTION NO: 34

Profits and losses on futures contracts are:

A. settled upfront

B. settled upon the expiry of the contract

C. settled by moving collateral

D. settled daily

ANSWER: D

Explanation:

Profits and losses on futures contracts are **settled daily** through the exchange's marking-to-market process. At the end of each trading day, the clearinghouse revalues every open futures position using that day's settlement price. If the contract price has moved favorably for a participant, the resulting variation margin is credited to that participant's margin account; if it has moved adversely, funds are debited and the participant may have to provide additional margin. Consequently, gains and losses are realized incrementally during the life of the contract rather than accumulating solely until the contractual maturity date.

Daily settlement is a core feature of exchange-traded futures and is supported by central clearing. It reduces the build-up of counterparty credit exposure because obligations are regularly settled and collateral requirements are updated as market values change. The initial margin posted when a futures position is opened is a performance bond, while the daily cash flows reflect the position's actual profit or loss. This daily mark-to-market mechanism is fundamental to the distinction between futures and many bilateral forward arrangements. The CME description of daily settlement and variation margin is available at CME Group: Mark-to-Market. The role of clearinghouses and margining in centrally cleared derivatives is also summarized by the Bank for International Settlements.

QUESTION NO: 35

Which of the following statements is true:

I. The OTC market for foreign exchange is much larger than the exchange traded futures market for foreign currencies

II. DVP arrangements help avoid the risk of counterparty defaults on settlements

III. Exchanges offer the advantage of lower trading costs than ECNs

IV. ISDA master agreements form the basis of a large number of OTC derivative trades

A. I, II and III

B. II and IV

C. I, III and IV

D. I, II and IV

ANSWER: D

Explanation:

I, II and IV is correct. Foreign exchange is predominantly an over-the-counter market: banks, dealers, institutional investors, corporations, and other counterparties transact currencies directly or through electronic dealer platforms at volumes far exceeding those in exchange-traded currency futures. The Bank for International Settlements' triennial survey is a principal source for measuring this enormous global OTC activity. See the BIS Triennial Central Bank Survey.

Delivery-versus-payment settlement arrangements link the final transfer of one asset to the final transfer of the corresponding payment. This coordination substantially reduces settlement principal risk: a party should not irrevocably deliver the asset unless payment is made. In foreign-exchange settlement, the equivalent concept is payment-versus-payment, which applies the same risk-control principle to the two currency payment legs. This supports the statement that DVP arrangements help avoid counterparty-default exposure at settlement.

ISDA Master Agreements are standard legal frameworks governing many bilateral OTC derivatives relationships. They establish core contractual terms, close-out netting provisions, events of default, termination rights, and collateral-related documentation, allowing counterparties to document multiple transactions consistently under one master contractual structure. ISDA describes these documents at its documentation resources page.

QUESTION NO: 36

A hedge fund offers a fund with an expected volatility of 12% and expected returns of 12%.

The risk free rate is 4%. An institutional investor wants the hedge fund manager to invest 60% of their total allocation to the fund, and the rest in the risk free asset. What expected return and volatility can the institutional investor expect?

A. 12% expected return and 12% volatility

B. 8.8% expected return and 7.2% volatility

C. 12% expected return and 7.2% volatility

D. Cannot be determined in the absence of correlation data between the two

ANSWER: B

Explanation:

8.8% expected return and 7.2% volatility is correct. The investor allocates 60% to the hedge fund and 40% to the risk-free asset. Portfolio expected return is the weighted average of the component expected returns: (0.60 × 12%) + (0.40 × 4%) = 8.8%. This calculation reflects that the investor earns the fund's expected return only on the capital invested in the fund, while the remaining capital earns the risk-free rate.

Because a risk-free asset has zero return volatility, it adds no variance to the portfolio. Consequently, the portfolio's volatility is simply the allocation to the risky fund multiplied by that fund's volatility: 0.60 × 12% = 7.2%. More formally, in the two-asset portfolio variance formula, every term involving the risk-free asset's standard deviation is zero. Therefore, no correlation estimate is needed to calculate volatility in this case; correlation does not affect the result when one asset has zero volatility.

This is the standard capital-allocation-line result: combining a risky portfolio with a risk-free asset scales both the risky portfolio's expected excess return and its volatility by the risky-asset weight. See CFA Institute: Portfolio Risk and Return, Part I and Investopedia: Capital Allocation Line.

QUESTION NO: 37

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:

5.03% is correct. First, use the bond's 5% yield, quoted with semiannual compounding, to obtain its market price. Per 100 of face value, the cash flows are 1.50 at six months, 1.50 at 12 months, and 101.50 at 18 months. Discounting these cash flows at 5% nominal compounded semiannually gives a price of approximately 97.14. The known six- and 12-month zero rates can then be used to bootstrap the final discount factor. The present values of the first two coupons are $1.50/(1 + 0.02/2) = 1.485$ and $1.50/(1 + 0.03/2)^2 = 1.456$. Subtracting them from the bond price leaves about 94.203 as the present value of the 101.50 maturity cash flow. Thus, $(1 + r/2)^3 = 101.50/94.203$, which gives an annualized nominal zero rate r of approximately 5.03%, with semiannual compounding. This is the standard bootstrapping principle: known zero-coupon discount factors are applied to earlier cash flows, and the remaining bond value identifies the discount factor for the final maturity. See the CFA Institute fixed-income market materials and the Federal Reserve Bank of New York market reference information for related fixed-income conventions.

QUESTION NO: 38

If the implied volatility is known for a call option, what can be said about the implied volatility for a put option with the same strike and maturity?

A. The implied volatility for the put will be the same as that for the call but with a negative sign

B. The implied volatility for the put will be the same as that for the call

C. The implied volatility for the put will be given by the expression [1 -] where is the implied volatility for the call

D. The implied volatility for the put cannot be determined from the implied volatility of the call

ANSWER: B

Explanation:

The implied volatility for the put will be the same as that for the call. Implied volatility is the volatility input which, when used in an option-pricing model with the relevant market inputs, makes the model value equal the option's observed market price. For a call and put written on the same underlying asset and having the same strike price and expiration, put-call parity links their no-arbitrage values. Consequently, when the call's market price implies a particular volatility, the parity-consistent put price implies that same volatility, provided the same pricing conventions and inputs are used, including interest rates, dividends or carrying costs, and exercise assumptions.

This result follows because volatility is a property of the common underlying-price distribution over the shared remaining life, rather than a signed quantity that differs by option direction. In practical markets, quoted call and put implied volatilities can occasionally differ slightly because of bid-ask spreads, liquidity, asynchronous quotes, discrete-dividend assumptions, model conventions, or temporary arbitrage frictions. The theoretical exam result, however, is that matched strike-and-maturity calls and puts have identical implied volatility under put-call parity. See the Options Industry Council's explanation of implied volatility and its overview of put-call parity.