Question #1 of 30

Regulators in most jurisdictions require banks to hold adequate capital against risks. Which key risk faced by a bank is usually required to hold capital reserves with the shortest time horizon?

- **A)** Credit risk.
- **B) Market risk.**
- **C)** Operational risk.
- **D)** Reputational risk.

Explanation

Typically, regulators consider credit and operational risk with a time horizon of one year and market risk with a shorter time horizon. Reputational risk is not a key risk faced by a bank.

(Book 3Module 25.1, LO 25.a)

Question #2 of 30

An insurance company faces moral hazard and adverse selection risks when determining which risks it should insure in order to maintain its profitability. Which of the following methods is used to mitigate against adverse selection?

- **A)** Coinsurance provisions.
- **B)** Deductibles.
- **C) Ongoing due diligence.**
- **D)** Policy limits.

Explanation

Adverse selection describes the situation where an insurer is unable to differentiate between a good risk and a bad risk. Ongoing due diligence (as well as greater initial due diligence) is a method that can be used against adverse

selection. Coinsurance provisions, deductibles, and policy limits are all methods used to mitigate against moral hazard.

(Book 3Module 26.1, LO 26.f)

Question #3 of 30

An investment advisor has an institutional client that is very risk-seeking and wishes to speculate on large price movements in foreign commodities. Which of the following types of hedge funds would be suitable for the client?

A) Dedicated short funds.

B) Emerging market funds.

C) Global macro funds.

D) Managed futures funds.

Explanation

Global macro managers make large bets on directional movements, typically in interest rates and exchange rates but also for commodities and stock indices.

A is incorrect. Dedicated short funds focus exclusively on finding a company that they think is overvalued and then short selling the stock. B is incorrect. Emerging market funds focus on investments in developing countries and not necessarily on foreign commodities. D is incorrect. Managed futures funds attempt to predict future movements in commodity prices based on either technical analysis or fundamental analysis. Such funds are not necessarily focused on large price movements or foreign commodities.

(Book 3Module 27.2, LO 27.f)

Question #4 of 30

An investor has USD 20,000 to invest and she is speculating that the price of Stock ABC will rise substantially in six months. The current price of the stock is USD 10. She is deciding between investing directly in the stock or purchasing six-month call options with a strike price of USD 15 for USD 1.60. How much profit/(loss) will the investor make after six months if she only purchases the options and the price of the stock is USD 12 in six months?

A) USD 0.

B) USD 4,000.

C) (USD 6,000).

D) (USD 20,000).

Explanation

Number of call options to purchase = USD 20,000 / USD 1.60 = 12,500

Profit = 12,500 × [max (0, USD 10 – USD 15) – USD 1.60] = –USD 20,000

A is incorrect. The investor earns USD 0 on the option position because it is out of the money but must pay for the call options (USD 1.60 × 12,500 = USD 20,000). B is incorrect. There would be a profit of USD 4,000 [(USD 12 – USD 10) × 2,000 shares] only if the investor directly invested in the stock without call options. C is incorrect. It is calculated as the difference between the call option strike price and the stock price in six months times the number of shares [(USD 15 – USD 12) × 2,000 shares].

(Book 3Module 28.2, LO 28.g)

Question #5 of 30

A portfolio manager currently has a USD 15 million equity exposure with a beta of 1.25 relative to the S&P 500 and would like to hedge the position for the next three months. Currently, three-month S&P 500 futures contracts are trading at 1,098. A tailing the hedge adjustment is required so that, when evaluating the next daily settlement period, the futures price has moved to 1,102 and the S&P 500 spot price is 1,116. How many S&P 500 contracts should be sold after making a tailing the hedge adjustment (assume a multiplier of 250)?

A) 67 contracts.

B) 68 contracts.

C) 69 contracts.

D) 70 contracts.

Explanation

Because of the long equity position, a short hedge is required. Therefore, S&P 500 contracts must be sold.

1.25 × [(USD 15,000,000 / 1,098 × 250) = 68 contracts (before tailing the hedge adjustment)

1.25 × [(USD 15,000,000 / 1,098 × 250) × (1,116/1,102) = 69 contracts (after tailing the hedge adjustment)

(Book 3Module 32.2, LO 32.e)

Question #6 of 30

A summary of rates that an investor should expect to realize on bond investments for specific maturities is provided below:

Bond maturity in years	Spot rate
1	1.50%

2	2.00%
3	2.50%
4	3.25%
5	4.00%

The three-year forward rate starting in one year is closest to:

A) 1.75%.

B) 3.00%.

C) **3.84%.**

D) 5.53%.

Explanation

$$[\{(1.0325)^4/(1.015)^1\}^{1/3}] - 1 = 3.84\%$$

A is incorrect. It is simply the difference between the four-year spot rate and the one-year spot rate. B is incorrect. It is the two-year forward rate starting in one year. D is incorrect. It is the one-year forward rate starting in three years.

(Book 3Module 40.2, LO 40.h)

Question #7 of 30

You have a short Treasury bond interest rate futures position. The bonds pay coupons semiannually on June 30 and December 31 each year. Assuming the quoted futures price is 96-24/32, which of the following bonds is the cheapest-to-deliver bond?

Bond	Quoted Bond Price	Conversion Factor	Coupon Rate (%)
1	124	1.18	6%
2	106	1.02	4%
3	114	1.11	5%
4	102	1.01	3%

A) Bond 1.

B) Bond 2.

C) Bond 3.

D) **Bond 4.**

Explanation

96-24/32 means 96% of par + 24 / 32 = 96.75%

Cost of delivery	=	quoted bond price − (quoted futures price × CF)		
Bond 1 cost	=	124 − (96.75 × 1.18)	=	9.84
Bond 2 cost	=	106 − (96.75 × 1.02)	=	7.32
Bond 3 cost	=	114 − (96.75 × 1.11)	=	6.61
Bond 4 cost	=	102 − (96.75 × 1.01)	=	4.28

Bond 4 is the cheapest to deliver.

(Book 3Module 43.2, LO 43.f)

Question #8 of 30

There is a USD 5 million notional swap that pays a floating rate based on the six-month LIBOR and receives a 5% fixed rate semiannually. The swap has a remaining life of 15 months with pay dates at 3, 9, and 15 months. Spot LIBOR rates are as follows: 3 months at 4.3%, 6 months at 4.6%, 9 months at 4.8%, 12 months at 4.9%, and 15 months at 5.1%. The LIBOR at the last payment date was 4.5%. What is the value of the swap to the fixed-rate receiver?

A) USD 167.

B) USD 2,586.

C) USD 1,444.

D) USD 22,394.

Explanation

B_{fixed} = (125,000 / $1.043_{0.25}$) + (125,000 / $1.048^{0.75}$) + (5,125,000 / $1.051^{1.25}$) = 123,691 + 120,681 + 4,816,044 = 5,060,416

$B_{floating}$ = {5,000,000 + [5,000,000 × (0.045 / 2)]} / $1.043^{0.25}$ = 5,058,972

V_{swap} = B_{fixed} − $B_{floating}$ = 5,060,416 − 5,058,972 = 1,444

(Book 3Module 44.2, LO 44.g)

Question #9 of 30

An investor holds both American call and put options on Stock A that all expire in six months. The strike prices of all the options are identical and Stock A is currently trading at the strike price. The investor is considering early

exercise of the put or the call options depending on which direction the price of Stock A moves in the coming months. Which type of American option should only be exercised on the expiration date?

A) Call option on dividend-paying stock.

B) Call option on non-dividend-paying stock.

C) Put option on dividend-paying stock.

D) Put option on non-dividend-paying stock.

Explanation

It is never optimal to exercise an American call on a non-dividend-paying stock. When an American call is exercised, it is only worth $S_0 - X$. Since that value is never larger than $S_0 - Xe^{-rT}$, it is never optimal to exercise early. The investor can keep the cash equal to X, which would be used to exercise the option early, and invest that cash to earn interest until expiration. Exercising the American call early means the investor would forego the interest.

A is incorrect. Early exercise of an American call on a dividend-paying stock can be valuable because options are not adjusted for cash flows on the underlying asset. Therefore, exercising early (i.e., prior to payment of a dividend) can be valuable because the stock can be sold at its pre-dividend price or held to receive the dividend. C and D are incorrect. American puts (both dividend and non-dividend paying) are optimally exercised early if they are sufficiently in the money (i.e., the underlying stock price is sufficiently low). The option can be exercised and the payoff $(X - S_0)$ can be invested to earn interest. In the extreme case when S_0 is close to zero, the future value of the exercised cash value, Xe^{rT}, is always worth more than a later exercise X.

(Book 3Module 37.2, LO 37.d)

Question #10 of 30

An options trader is interested in purchasing an American option. To reduce costs, he describes that he is willing to transact in the over-the-counter market and purchase an option whereby the early exercise may be restricted to certain discretely spaced dates. What type of option is the trader describing?

A) Bermudan option.

B) Chooser option.

C) Gap option.

D) Asian option.

Explanation

A Bermudan option allows early exercise only on certain dates.

B is incorrect. A chooser option allows the option holder, after a certain period of time has elapsed, to choose whether the option is a call or a put. C is incorrect. A gap option has two strike prices. If the two strike prices are

equal, the gap option payoff will be the same as an ordinary option. If the two strike prices differ and the payoff for a gap option is nonzero, there will be a gap in the payoff graph that is either increased or decreased by the difference between the strike prices. D is incorrect. An Asian option has payoff profiles based on the average price of the security over the life of the option.

(Book 3Module 39.2, LO 39.e)

Question #11 of 30

The primary role of central counterparties (CCPs) is to provide reduced risk of default or non-payment by its members to each other. For example, CCPs clear over-the-counter (OTC) derivatives transactions. However, in the process of performing their role, CCPs face several key and substantial risks. Which of the following risks is least likely to be faced by a CCP?

   A) Legal risk.

   B) Liquidity risk.

   C) Model risk.

   D) Settlement and payment risk.

Explanation

Settlement and payment risk refers to the risk that a bank no longer provides cash settlement services between a CCP and its members. Although it is a potential risk to CCPs, it is not one of the key risks.

A is incorrect. Legal risks in the form of litigation or claims may arise due to laws that are inconsistent with the CCP's regulations (i.e., netting). B is incorrect. There are large amounts of cash inflows and outflows flowing through the CCP due to initial margins and margin calls. As a result, CCPs are exposed to liquidity risk. Also, by clearing OTC transactions, some of which involve illiquid securities, the CCP is exposed to liquidity risk. C is incorrect. OTC derivatives are not priced by the market but are instead priced using valuation models that perform the mark-to-market function, which subjects CCPs to model risk.

(Book 3Module 30.2, LO 30.h)

Question #12 of 30

Interest rates in Australia and Canada are currently 2% and 3%, respectively. The spot rate is 1.05 AUD/CAD. Using interest rate parity, what is the one-year forward rate for CAD from the perspective of a Canadian investor?

   A) 0.9432.

   B) 0.9617.

   C) 1.0398.

D) 1.0603.

Explanation

For a Canadian investor, the domestic currency (DC) is CAD and the foreign currency (FC) is AUD. Using interest rate parity, the forward rate is calculated as follows: spot (DC / FC) × [(1 + r_{DC}) / (1 + r_{FC})]. The spot rate is expressed as FC / DC, so the reciprocal must be computed to get DC / FC. Therefore, the spot rate is expressed as DC / FC = 1 / 1.05 = 0.9524.

Forward rate = 0.9524 × (1.03 / 1.02) = 0.9617

A is incorrect because it reverses the numerator (3%) and denominator (2%) in the second term. C is incorrect because it assumes the AUD is the domestic currency. D is incorrect because it assumes the AUD is the domestic currency and it reverses the numerator and denominator in the second term.

(Book 3Module 33.2, LO 33.k)

Question #13 of 30

A homeowner has an existing 20-year, 4% fixed-rate mortgage (level payment and fully amortizing) with a current balance of USD 400,000. In view of falling mortgage interest rates, if the mortgage was refinanced today into a new 20-year, 3% fixed-rate mortgage, which of the following amounts is closest to the amount that the homeowner would save in biweekly mortgage payments?

A) **USD 94.71.**

B) USD 102.61.

C) USD 153.84.

D) USD 205.53.

Explanation

Current biweekly mortgage payments: N = 26 × 20 = 520, I / Y = 4 / 26 = 0.153846, PV = USD 400,000. Solve for PMT = USD 1,118.08.

New biweekly mortgage payments: N = 26 × 20 = 520, I / Y = 3 / 26 = 0.115385, PV = USD 400,000. Solve for PMT = USD 1,023.37.

Savings = USD 1,118.08 – USD 1,023.37 = USD 94.71.

B is incorrect. It calculates semimonthly mortgage payments.

Current payments: N = 480, I / Y = 4 / 24 = 0.166667, PV = USD 400,000. Solve for PMT = USD 1,211.30.

New payments: N = 480, I / Y = 3 / 24 = 0.125, PV = USD 400,000. Solve for PMT = USD 1,108.69.

Savings = USD 1,211.30 – USD 1,108.69 = USD 102.61.

C is incorrect. It attempts to calculate the interest differential.

Current interest portion of payment = USD 400,000 × 4% / 26 = USD 615.38.

New interest portion of payment = USD 400,000 × 3% / 26 = USD 461.54.

Savings = USD 615.38 – USD 461.54 = USD 153.84.

D is incorrect. It calculates monthly mortgage payments.

Current payments: N = 240, I / Y = 4 / 12, PV = USD 400,000. Solve for PMT = USD 2,423.92.

New payments: N = 240, I / Y = 3 / 12 = 0.25, PV = USD 400,000. Solve for PMT = USD 2,218.39.

Savings = USD 2,423.92 – USD 2,218.39 = USD 205.53.

(Book 3Module 42.1, LO 42.b)

Question #14 of 30

An 18-month futures contract on an equity index is currently priced at USD $3,793.85. The underlying stocks are currently valued at $3,625 and have a continuously compounded dividend yield of 2%. The continuously compounded risk-free rate is 5%. What is the potential arbitrage profit per contract and the appropriate strategy?

A) $1—buy the futures, sell the spot.
B) $2—buy the futures, sell the spot.
C) $1—sell the futures, buy the spot.
D) $2—sell the futures, buy the spot.

Explanation

$F = S \times [(1 + \text{risk-free rate}) / (1 + \text{dividend yield})]^T$

$F = 3{,}625 \times (1.05 / 1.02)^{1.5}$

$F = 3{,}786$

As the actual future's price is higher, we sell the futures and buy the spot, earning an arbitrage profit of $3,793 – $3,786 = $7.

(Book 3Module 34.1, LO 34.f)

Question #15 of 30

What is the natural gas implied storage cost if the October 2009 spot price is 5.128, assuming the annual risk-free rate is 5.5% and the one-year forward price is 5.522?

A) $0.405.

B) $0.305.

C) $0.205.

D) $0.106.

<u>Explanation</u>

Forward price = (spot + storage costs) × (1 + risk-free rate)

5.522 = (5.128 + storage costs) × (1.055)

(5.522 / 1.055) − 5.128 = storage costs

$0.106 = storage costs

(Book 3Module 36.2, LO 36.b)

Question #16 of 30

A risk manager has calculated the daily VaR at a 95% confidence level of an investment to be USD 50,000. Which of the following amounts is closest to monthly VaR at a 99% confidence level? Assume 250 days per year and 50 weeks per year.

A) USD 315,760.

B) USD 331,171.

C) USD 349,640.

D) USD 386,725.

<u>Explanation</u>

To convert from a 95% confidence level to a 99% confidence level, multiply by the ratio of the z-value of the new confidence level by the z-value of the current confidence level. Therefore, USD 50,000 × 2.33 / 1.65 = USD 70,606.

Converting from daily to monthly would result in 5 days per week or 20 days per month based on the assumptions provided. Therefore, multiply by the square root of 20, which equals USD 70,606 × $(20)^{1/2}$ = USD 315,760.

B is incorrect. It multiplies by the square root of 22, not 20. C is incorrect. It uses 2.58 as the z-value, not 2.33. D is incorrect. It multiplies by the square root of 30, not 20.

(Book 4Module 45.1, LO 45.d)

Question #17 of 30

An analyst is computing the VaR of an investment in Capsule Music, Inc. The company's stock is trading at USD 32.50 and has a daily volatility of 2.0%. Using the delta-normal method, which of the following amounts is closest to daily VaR at the 99% confidence level of a long position in an at-the-money call on the stock (with a delta of 0.5)?

   A) USD 0.53.

   B) USD 0.76.

   C) USD 0.84.

   D) USD 1.51.

Explanation

The delta of an at-the-money call is 0.5.

$$\text{Daily VaR} = \text{delta} \times \text{critical z-value} \times \text{volatility} \times \text{stock price} = 0.5 \times 2.33 \times 0.02 \times 32.50 = 0.76$$

A is incorrect. It uses 1.645 as the z-value instead of 2.33. C is incorrect. It uses 2.58 as the z-value instead of 2.33. D is incorrect. It uses 1.0 as the delta instead of 0.5.

(Book 4Module 46.1, LO 46.a)

Question #18 of 30

A risk manager is on her first day at her job at an investment firm and is attempting to clearly define the firm's various measures of risk for its portfolios and sub-portfolios. Which property of a coherent risk measure states that a portfolio with greater future returns will likely have less risk?

   A) Monotonicity.

   B) Positive homogeneity.

   C) Subadditivity.

   D) Translation invariance.

Explanation

Monotonicity infers that if a random future value R_1 is always greater than a random future value R_2, then the risk of the return distribution for R_1 is less than the risk of the return distribution for R_2.

B is incorrect. Positive homogeneity suggests that the risk of a position is proportional to its size. C is incorrect. Subadditivity states that a portfolio made up of sub-portfolios will have equal or less risk than the sum of the risks of each individual sub-portfolio. It assumes that when individual risks are combined, there may be some diversification benefits or, in the worst case, no diversification benefits and no greater risk. D is incorrect. Translation invariance implies that the addition of a sure amount reduces the risk at the same rate as the cash needed to make the position acceptable.

(Book 4Module 45.2, LO 45.f)

A quantitative analyst has been asked to examine the purchase of a 12-month European call option on Stock Z using a two-step binomial tree model. Stock Z does not pay dividends. The annual standard deviation is 12% and the continuously compounded annual risk-free rate is 3%. What is the risk-neutral probability of the stock price going down in a single step?

A) 40.3%.

B) 43.0%.

C) 57.0%.

D) 59.7%.

Explanation

Because the valuation is using a two-step binomial tree for a 12-month call, the relevant period for a single step is 6 months (t = 0.5).

$U = e^{0.12 \times \sqrt{0.5}} = 1.0886$, $D = 1 / 1.0886 = 0.9186$

Risk-neutral probability (up) = $\pi_U = (e^{0.03 \times 0.5} - D) / (U - D) = (1.0151 - 0.9186) / (1.0886 - 0.9186) = 0.57$

Risk-neutral probability (down) = $\pi_D = 1 - 0.57 = 0.43$

C is incorrect because it is the risk-neutral probability of the stock price going up. A and D are incorrect because they do not use 0.5 in the calculations to account for six months as a single step. Furthermore, D is incorrect because it attempts to calculate the risk-neutral probability of the stock price going up.

$U = e^{0.12 \times \sqrt{1}} = 1.1275$, $D = 1 / 1.1275 = 0.8869$

Risk-neutral probability (up) = $\pi_U = (e^{0.03 \times 1} - D) / (U - D) = (1.0305 - 0.8869) / (1.1275 - 0.8869) = 0.5968$

Risk-neutral probability (down) = $\pi_D = 1 - 0.5968 = 0.4032$

(Book 4Module 58.1, LO 58.a)

An options analyst is pricing a one-year European put option on Stock Y using the Black-Scholes-Merton (BSM) model. Stock Y will be paying a dividend of USD 2.00 per share on an ex-dividend date two months from now and will not be paying any further dividends for two years. The analyst has gathered the following information:

Current stock price	USD 60
Risk-free rate	4% per year continuously compounded
Option exercise price	USD 65

N(d1)	0.7285
N(d2)	0.6984

What is the price of a one-year European put option on Stock Y?

  A) USD 0.

  B) USD 1.36.

  C) USD 2.55.

  D) USD 3.09.

Explanation

European put value = $[Ke^{-rT} \times (1 - N(d_2))] - [S_0 \times (1 - N(d_1))]$

Because of the dividend, S_0 is reduced by the present value (PV) of the dividend.

PV = $2e^{-0.04 \times 2/12}$ = 1.99

S_0 = 60 − 1.99 = 58.01

Put = $[65e^{-0.04(1)} \times (1 - 0.6984)] - [58.01 \times (1 - 0.7285)]$ = 18.84 − 15.75 = 3.09

A is incorrect as the d_1 and d_2 terms are reversed.

$[65e^{-0.04(1)} \times (1 - 0.7285)] - [58.01 \times (1 - 0.6984)]$ = 16.96 − 17.49 = −0.53

Since options cannot have a negative value, the minimum option value is zero.

Alternatively, zero is the intrinsic value of the call option since the call option is out of the money by virtue of the stock price being below the exercise price.

B is incorrect as it omits the "1 −" in each of the bracketed terms.

$[65e^{-0.04(1)} \times 0.6984)] - [58.01 \times 0.7285)]$ = 43.62 − 42.26 = 1.36

C is incorrect as it omits the dividend in calculating S_0.

$[65e^{-0.04(1)} \times (1 - 0.6984)] - [60 \times (1 - 0.7285)]$ = 18.84 − 16.29 = 2.55

(Book 4Module 59.3, LO 59.g)

Question #21 of 30

The current stock price of Company M is USD 30. A risk manager is monitoring call and put options on Company M with exercise prices of USD 60 and five days to maturity. Which of the following scenarios is most likely to occur if the stock price rises by USD 1?

      Call value   Put value

A) Increase by 0.10   Decrease by 0.10

B) Increase by 0.90   Decrease by 0.10

C) Increase by 0.10   Decrease by 0.90

D) Increase by 0.90   Decrease by 0.90

Explanation

The call option is deep out of the money and must have a delta close to zero. The put option is deep in the money and must have a delta close to minus one. Therefore, the value of the out of the money call will *increase* by close to zero (i.e., USD 0.10), and the value of the in-the-money put will *decrease* by a much larger amount closer to USD 1 (i.e., USD 0.90).

(Book 4 Module 60.2, LO 60.d)

Question #22 of 30

A U.S. government bond with a 5% coupon and USD 1,000 par value pays its coupons semiannually on June 15 and December 15. It is priced to provide for a 4% yield to maturity. The bond is purchased and it settles on August 21, 2019; the bond matures on June 15, 2021. What is the clean price of the bond?

A) USD 1,012.04.

B) USD 1,017.31.

C) USD 1,019.04.

D) USD 1,026.46.

Explanation

With a bond maturity date of June 15, 2021, there are four coupon payments remaining. The value of the bond on the last coupon date (June 15, 2019) is calculated as N = 4, PMT = 25, I / Y = 2, and FV = 1,000. Solving for PV, PV = 1,019.04.

The dirty (full) price of the bond = $1{,}019.04 \times (1.02)^{67/183} = 1{,}026.46$

The clean (flat) price of the bond = $1{,}026.46 - (25 \times 67 / 183) = 1{,}017.31$

A is incorrect. It does not take into account the semiannual payment of coupons.

(Book 4 Module 53.2, LO 53.f)

Question #23 of 30

An investor is looking to invest in short-, intermediate-, or long-term bonds and is analyzing various scenarios involving changes in the yield curve shape. Assuming an upward-sloping yield curve and the expectation of an increase in general interest rates, in which situation would it be relatively least attractive to be invested solely in intermediate-term bonds?

A) **A negative butterfly.**

B) A positive butterfly.

C) A flattening of the yield curve.

D) A steepening of the yield curve.

Explanation

A negative butterfly means that there is more curvature to the yield curve. Therefore, if rates increase, intermediate maturity yields increase more than the long and short maturity yields. As a result, the price fall will be comparatively higher for intermediate bonds, which makes them relatively less attractive. *(Note: If rates decrease, intermediate maturity yields decrease less than the long and short maturity yields. As a result, the price rise will be comparatively lower for intermediate bonds, which makes them relatively less attractive.)*

B is incorrect. A positive butterfly means that there is less curvature to the yield curve. Therefore, if rates increase, intermediate maturity yields increase less than the long and short maturity yields. As a result, the price fall will be comparatively lower for intermediate bonds, which makes them relatively more attractive. *(Note: If rates decrease, intermediate maturity yields decrease more than the long and short maturity yields. As a result, the price fall will be comparatively higher for intermediate bonds, which makes them relatively more attractive.)*

C is incorrect. If the yield curve flattens, short-term yields rise by more than long-term yields. Intermediate-term yields will rise somewhere in between, which makes them neither relatively more nor less attractive. *(Note: If rates decrease, long-term yields fall by more than short-term yields, but intermediate-term yields would still be in between.)*

D is incorrect. If the yield curve steepens, long-term yields rise by more than short-term yields. Intermediate yields will rise somewhere in between, which makes them neither relatively more nor less attractive. *(Note: If rates decrease, short-term yields fall by more than long-term yields, but intermediate-term yields would still be in between.)*

(Book 4Module 54.3, LO 54.g)

Question #24 of 30

A fixed income manager wants to perform sensitivity analysis regarding the impact of various interest rate changes on the price of an option-free bond currently trading at par. The bond has a duration of 8.25 and a convexity of 212.5. Using the duration/convexity approximation, the percentage price change of a 75-basis-point increase in interest rates is closest to:

A) –4.99%.

B) –5.59%.

C) –6.19%.

D) –6.79%.

Explanation

$$[-8.25 \times 0.0075 \times 100] + [½ \times 212.5 \times (0.0075)^2 \times 100] = -6.1875\% + 0.5977\% = -5.5898\%$$

A is incorrect because it omits the ½ in the convexity adjustment. C is incorrect because it omits the convexity adjustment entirely. D is incorrect because it subtracts the convexity adjustment.

(Book 4Module 56.2, LO 56.f)

Question #25 of 30

An analyst has gathered the following data on interest rates and Moody's ratings:

Country	Interest rate on dollar-denominated 10-year sovereign bond	Interest rate on 10-year U.S. Treasury bond	Moody's sovereign bond rating
A	5.8%	2.5%	B1
B	5.1%	2.5%	B3
C	5.8%	2.5%	B3
D	5.1%	2.5%	B1

Which country is most likely to default on its foreign debt?

A) Country A.

B) Country B.

C) Country C.

D) Country D.

Explanation

Because the U.S. Treasury bond is considered to be risk free, the spread above the 10-year U.S. Treasury bond rate reflects the market's assessment of the default risk of the particular country's bond. Country C has the combination of the highest sovereign default spread (5.8% – 2.5% = 3.3%) and the lowest Moody's rating (B3), which makes it the most likely country to default on its foreign debt.

(Book 4Module 48.1, LO 48.a)

An analyst has prepared the following one-year transition matrix.

Rating from	Rating to			
	A	B	C	Default
A	90%	5%	5%	0%
B	5%	85%	5%	5%
C	0%	5%	80%	15%

The probability that a C-rated firm will default over a two-year period is closest to:

   A) 15%.

   B) 27%.

   C) 28%.

   D) 30%.

Explanation

At the end of Year 1, there is a **15%** chance of default and an 80% chance that the firm will maintain a C rating.

In Year 2, there is a 15% chance of default if the firm was rated C after one year (80% × 15% = **12%**). There is a 0% chance of the firm being rated A after one year. There is a 5% chance of default if the firm was rated B after one year (5% × 5% = **0.25%**).

The probability of default over two years is 15% + 12% + 0.25% = 27.25%.

(Book 4Module 48.2, LO 48.h)

Within an institution, the board of directors and management share some common responsibilities but they also have distinct responsibilities within an institution. Which responsibility is generally shared by both the board and management?

   A) Conduct stress tests.

   B) Regularly update stress-testing activities.

   C) Actively challenge the results of stress tests.

   D) Report on the governance, validation, and independent review of stress tests.

Explanation

Board members should be critical of stress test results by actively challenging assumptions as appropriate. Management should also actively challenge stress test results; therefore, it is critical that management remain knowledgeable of the details of the stress-testing activities.

A is incorrect. Management conducts stress tests to ensure that the institution is sufficiently flexible to withstand new risks and vulnerabilities. B is incorrect. Management should regularly update stress-testing activities given changing risks, data sources, and internal or external operating environments. D is incorrect. Management should report back to the board on all aspects of stress tests and stress test results.

(Book 4Module 52.2, LO 52.g)

Questions #28-29 of 30

Questions 17 and 18 refer to the following information.

The parameters of a generalized autoregressive conditional heteroskedastic (GARCH)(1,1) model are $\alpha = 0.03$, $\beta = 0.82$, and $\omega = 0.000009$. Assume daily volatility is estimated at 0.8% and today's stock market return is 5%.

Question #28 of 30

What is the new estimate of volatility using the GARCH(1,1) model?

A) 0.0136%.

B) 0.2061%.

C) 1.168%.

D) 4.540%.

Explanation

    Variance using GARCH(1,1) model = $0.000009 + (0.03 \times 0.05^2) + (0.82 \times 0.008^2) = 0.000136$

    Volatility using GARCH(1,1) model = $(0.000136)^{1/2} = 1.168\%$

A is incorrect. It is the variance. B is incorrect. It attempts to calculate the variance but switches the α and β amounts in the 2nd and 3rd terms of the equation. D is incorrect. It attempts to calculate the volatility but switches the α and β amounts in the second and third terms of the equation.

(Book 4Module 47.3, LO 47.i)

Question #29 of 30

What is the implied long-run volatility level?

A) 0.004%.

B) 0.006%.

C) 0.655%.

D) 0.775%.

<u>Explanation</u>

Long-run average variance = $\omega / (1 - \alpha - \beta) = 0.000009 / (1 - 0.03 - 0.82) = 0.00006$

Long-run standard deviation (volatility) = $(0.00006)^{1/2} = 0.775\%$

A is incorrect. It attempts to calculate the long-run average variance but adds 0.03 in the denominator instead of subtracting it. B is incorrect. It is the long-run average variance. C is incorrect. It attempts to calculate the long-run volatility but adds 0.03 in the denominator instead of subtracting it.

(Book 4Module 47.3, LO 47.i)

Question #30 of 30

A company has borrowed USD 9.4 million. You estimate that the company has a probability of default (PD) of 1.7% and a recovery rate of 70%. What is the expected loss?

A) $35,700.

B) $42,850.

C) $47,940.

D) $52,150.

<u>Explanation</u>

Expected loss = exposure amount (EA) × PD × loss ratio (LR)

LR = 1 − recovery rate

Expected loss = $9.4 million × 0.017 × 0.30

Expected loss = $47,940

(Book 4Module 50.1, LO 50.c)