FRM Part I Exam

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Questions - Valuation and Risk Models

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Reading 45: Measures of Financial Risk

Q.939 Billy Marquette has recently joined a small company that provides private commercial jets to royal families, government officials, and directors of big firms. Marquette is a retired commercial pilot with a very basic understanding of finance. On his first day, he is handed a report on risk management measures. The excerpt from the report says "due to volatility in oil prices, the company has a weekly 90% VaR of €20,000". Which of the following is the most appropriate explanation of the excerpt?

A. There is a 90% probability that the company will experience a loss of €2,000 on a weekly basis.

B. There is a 10% probability that the company will experience a loss of €20,000 in any given week.

C. There is a 90% probability, in any given week, that the company will experience a loss of more than €20,000.

D. There is a 10% probability, in any given week, that the company will experience a loss in excess of €20,000.

Q.975 Anshuman, a risk consultant working at Dominic Republic Bank, uses VaR to measure the risks of his bank's positions. He makes the following statements in his consultant report with regard to VaR. Which of the following statement(s) can be accepted by the risk committee of the firm?
I. VaR is simply the negative of the q_p quantile of the profit and loss (P/L) distribution

II. VaR is defined contingent on two arbitrarily chosen parameters: a confidence level and a holding or horizon period
III. VaR not only rises with the confidence level but rises at a decreasing rate

A. I only.

B. I and II only.

C. II and III only.

D. All of the above.

Q.978 ANG National Bank intends to use the coherent risk measure to measure the risk of its assets. A risk measure is said to be coherent if it satisfies the properties such as:
I. Monotonicity
II. Sub-additivity
III. Homogeneity
IV. Translational invariance

A. I, III & IV only

B. I, II & IV only

C. II, III & IV only

D. All of the above

Q.980 John Adams, a newly recruited junior analyst, is asked to compare expected shortfall and Value at Risk. He jots down the following points in his notes. Which of them are correct?
I. While the expected shortfall (ES) tells what to expect in bad states, i.e., it gives an idea of how bad might it be, Value at Risk tells us nothing other than to expect a loss higher than the Value at Risk itself
II. The expected shortfall-based rule is consistent with expected utility maximization if risks are rankable by a second-order stochastic dominance rule, while a Value-at-Risk-based rule is only consistent with expected utility maximization if risks are rankable by a more stringent first-order stochastic dominance rule
III. The expected shortfall and Value at Risk always satisfy sub-additivity
IV. Finally, the subadditivity of ES implies that the portfolio risk surface will be convex, and convexity ensures that portfolio optimization problems using ES measures, unlike ones that use VaR measures, will always have a unique well-behave optimum

A. I, III & IV only

B. I, II & IV only

C. II, III & IV only

D. All of the above

Q.981 Andrew Simons, a risk analyst, is working on risk measures. He is particularly interested in the risk aversion property of risk measures.
Which of the following statement(s) is/are true with regard to the risk aversion property of risk measures?

I. If a user has a 'well-behaved' risk-aversion function, then the weights will rise smoothly, and the rate at which weights rise will be related to the degree of risk aversion: the more risk-averse the user, the more rapidly the weights will rise
II. Expected shortfall is characterized by all losses in the tail region having the same weight implying that the user is risk-neutral between tail-region outcomes
III. In case of Value at Risk (VaR), the weight of the loss associated with a p-value equal to α implies that the user is actually risk-loving

A. I and II only.

B. I only.

C. II and III only.

D. All of the above.

Q.3325 Which of the following is NOT a property of coherent risk measures?

A. $Y \geq X \Rightarrow \rho(Y) \geq \rho(X)$

B. $\rho(X + Y) \leq \rho(X) + \rho(Y)$

C. $\rho(hX) = h\rho(X)$ for $h > 0$

D. $\rho(x + n) \leq \rho(X) - n$ for some n

Q.3328 An investment company has a portfolio which has the following ordered performance by historical data. Calculate the expected shortfall $ES_{0.95}$.

Probabilty	1%	5%	10%	12%	15%
Profit/Loss	−500	−300	−100	−90	−50

A. 300

B. 340

C. 400

D. 425

Q.3329 An investment company has a portfolio which has the following ordered performance by historical data. Calculate the expected shortfall, $ES_{0.99}$, i.e., at 99% level of confidence

Probabilty	1%	5%	10%	12%	15%
Profit/Loss	−500	−300	−100	−90	−50

A. 168

B. 400

C. 460

D. 500

Q.3397 A hypothetical portfolio of securities exhibits the following expected losses shown:

Name	Loss (million dollar)	Probability (%)
1	10	40%
2	20	35%
3	50	15%
4	100	5%
5	200	2.5%
6	225	2%
7	250	0.5%

Calculate the expected shortfall at the 95% and 99% confidence level?

A. ES (95%) = $225 million; ES (99%) = $237.5 million

B. ES (95%) = $215 million; ES (99%) = $237.5 million

C. ES (95%) = $217.5 million; ES (99%) = $250 million

D. ES (95%) = $225 million; ES (99%) = $250 million

Q.3398 The VaR of a loan portfolio is computed at various confidence levels:

Confidence Level	VaR
95.0%	2%
95.5%	5%
96.0%	6%
96.5%	7%
97.0%	9%
97.5%	10%
98.0%	13%
98.5%	15%
99.0%	20%
99.5%	30%

What is the expected shortfall at the 97.5% confidence level?

A. 0.1

B. 0.15

C. 0.195

D. 0.2

Q.3399 Among the given portfolios, which one falls below the Markowitz efficient frontier?

Portfolio	Expected Return	Expected Standard Deviation
A	12%	10%
B	14%	12%
C	15%	12%
D	16%	20%

A. Portfolio A

B. Portfolio B

C. Portfolio B and C

D. Both Portfolio B and D

Q.3588 Which of the following statement is INCORRECT regarding the efficient frontier?

A. A risk-averse investor will only choose portfolios along the efficient frontier

B. Portfolios that deliver the greatest return on each level of standard deviation make up the efficient frontier

C. The graph that shows the efficient frontier has the variance on its Y-axis

D. None of the above

Q.4639 A hypothetical portfolio has an annual 1% VaR of $45,000. Which of the following statements is the **most likely** correct about the portfolio?

A. The loss over the next year is expected to be at most $45,000 in 1% of the cases.

B. There is only a 1% chance that we will gain more than $45,000 over the next year.

C. The likelihood of losing more than $45,000 over the next year is 1%.

D. The likelihood of losing no more than $45,000 over the next year is 1%.

Q.4640 The investment returns and the corresponding probabilities are given in the following table:

Returns	Probability
20%	0.1
30%	0.3
−10%	0.2
15%	0.3
7%	0.1

What is the standard deviation of the investment returns?

A. 0.142

B. 0.154

C. 0.132

D. 0.138

Q.4641 An investor invests his funds in two correlated assets, A and B. The standard deviation of asset A is 20%, and that of B is 15%. The portfolio variance is 2.84%. Given that the investor has three times as much money in asset A than he has in asset B, what is the correlation coefficient between assets A and B?

A. 0.0962

B. 0.2133

C. 0.3994

D. 0.8078

Q.4642 The losses from a portfolio for one year are normally distributed with a mean of -10 and a standard deviation of 20. What is the value of the one-year 99% VaR?

A. 35.6

B. 36.5

C. 37.5

D. 39

Q.4643 The losses from a portfolio for one year are normally distributed with mean -10 and standard deviation 20. What is the value of the 99% expected shortfall?

A. 52.85

B. 37.40

C. 42.85

D. 26.43

Reading 46: Calculating and Applying VaR

Q.972 After using of the historical simulation method, you have been provided with the following 30 ordered percentage returns for an asset:
[-18, -16, -14, -12, -10, -9, -7, -7, -6, -6, -6, -5, -5, -4, -4, -4, -2, -1, 0, 0, 2, 3, 6, 12, 12, 13, 15, 15, 18, 28]

The value-at-risk (VaR) and expected shortfall (ES), at 90% confidence level, respectively, are closest to:

A. Var: 14; ES: 17

B. Var: 14; ES: 16

C. Var: 12; ES: 16

D. Var: 12; ES: 24

Q.973 Stuart Broad, a risk analyst working with Macquarie Bank compiles data of 100 simulated percentage returns of the bank's assets:
[-13.33, -12.25, -11.75, -10.66, -8.45, -7.13, -6.48, -5.29 ... 2.89, 3.56, 4.29, 5.38, 6.65, 7.89, 8.54, 9.64, 10.27, 12.28, 13.25]

Using the data, he calculates the expected shortfall (ES) and the value at risk (VAR) of the bank's assets at the 95 percent confidence level using the historical simulation method. What is the expected shortfall and the value at risk computed by Stuart Broad?

A. Expected shortfall: 12; Value at Risk: 9.45

B. Expected shortfall: 11.49; Value at Risk: 9.95

C. Expected shortfall: 12; Value at Risk: 8.45

D. Expected shortfall: 11.49; Value at Risk: 8.45

Q.982 ANC National Bank handles a portfolio of assets amounting to USD 150 million. Antony Smith, a risk analyst, analyzes the portfolio and observes that the returns are independently identically normally distributed. The annual standard deviation of the portfolio is 0.55. What is the 20 day-Value at Risk at 95 percent confidence assuming 250 trading days in a year?

A. USD 51.92 million

B. USD 38.50 million

C. USD 53.67 million

D. USD 71.50 million

Q.1146 All the following are false with regards to Worst Case Scenario (WCS) measure, EXCEPT:

A. WCS indicates the number of times portfolio loss exceeds a given limit over a given period.

B. WCS indicates the maximum a portfolio can lose over a given period.

C. WCS indicates the probability of losing a given limit over a given period.

D. WCS indicates the minimum a portfolio can lose over a given period.

Q.1147 Plain vanilla European options and forwards are good examples of:

A. Linear derivatives.

B. Nonlinear derivatives.

C. A nonlinear and linear derivative, respectively.

D. A linear and nonlinear derivative, respectively.

Q.2616 Arthur Bell is the portfolio manager at FFF Investments. Recently, he bought 5,000 call options on stocks of one of the local growth-oriented oil refining companies that have never paid dividends. The strike price of the options was $50. The underlying stock is trading at $58 and has an annual volatility of return of 33%. Bell estimated the delta of these options to be 0.55. What is the approximate weekly (delta normal) 99% VaR of the position assuming 52 trading weeks in the year?

A. $7,725.57

B. $17,007

C. $6,659.97

D. $14,661.22

Q.2618 An investor is long at a short-term portfolio of at-the-money put options on an underlying asset. The notional value of the portfolio is $100,000. Assuming that there is one risk factor with a corresponding delta of 0.5, what is the amount of change in the portfolio if the value of the underlying asset changes by 12.5%?

A. $5,500.

B. $6,250.

C. $6,520.

D. $7,500.

Q.2619 After a significant increase in the volatility of shares of USY Pharma, Ross Grand, senior portfolio manager, decides to hedge the existing position by buying 300 at-the-money call options. Shares of USY are trading at $457 and the daily VaR of the underlying at 99% confidence is $42.59. What is the daily 99% VaR of the options position using the delta-normal method?

A. $3,457.99

B. $5,791.77

C. $4,524.05

D. $6,388.50

Q.2623 Ashli More prepares a presentation to the management board on the application of derivatives for hedging risk. She struggles with the classification of linear and non-linear derivatives. Which of the following is an example of linear derivatives?

A. Futures on stocks, forwards on broad market indices, and plain vanilla European options on bonds.

B. Interest rate swaps, interest rate caps, and plain vanilla American options on stocks.

C. Futures on broad market indices.

D. Futures on stocks and swaptions.

Q.2625 The investment division of a bank is considering an investment of $100,000,000 in one of the following:

- stocks of ALPHA Plc
- stocks of APPA Corporation
- 20-year bonds of APPA Corporation

Although the department seeks the investment with the highest expected return, to comply with bank's risk policies, the department cannot open a position with a daily 99% VaR higher than $6,000,000.
The investment opportunities presented above have the following features:

	Expected Annual Return	Expected annual volatility of returns	Modified Duration	Market Price
Stocks of ALPHA	20%	50%	–	$5 per stock
Stocks of APPA	13%	36%	–	$30 per stock
Bonds of APPA	8%	10%	3.5	99% per $100 nominal

Assuming zero daily returns and 252 trading days per year, which investment should the bank choose?

A. Stocks of ALPHA

B. Stocks of APPA

C. Bonds of APPA

D. None of the above

Q.2626 Two managers - X and Y - are looking to establish the 1-day VaR for a long position in an at-the-money call option on a non-dividend-paying stock with the following information: Current stock price: USD 100
Estimated annual stock return volatility: 15%
Current Black-Scholes-Merton call option value: USD 4.80,
Call option delta: 0.5
To compute VaR, manager X uses the delta-normal model, while manager Y opts for the Monte Carlo simulation method for full revaluation. Which manager will estimate a higher value for the 1-day 99% VaR?

A. Manager Y.

B. Manager X.

C. Both managers will have the same VaR estimate.

D. Insufficient information to determine.

Q.2627 Which of these statements regarding the Structured Monte Carlo (SMC) simulation is INCORRECT?

A. The SMC assumes normally distributed returns of derivative's underlying.

B. The SMC assumes that distributions used in the simulation are relevant going forward.

C. The SMC can generate correlated scenarios for multiple risk factors based on corresponding statistical distributions.

D. Increasing the number of SMC simulations will always improve the outcome of the simulation.

Q.3305 Bank A manages interest rate risk by monitoring the VaR using historical data. Bank A collects interest rate returns for 300 days and the data is sorted ascendingly. The lowest 10 interest rate returns are -4.2%, -4.0%, -3.8%, -3.2%, -3.0%, -2.5%, -2.3%, -2.2%, -2.0%, -1.7%. After 30 days, Bank A collects 30 more data points. However, none of these returns is less than -1.7%. What is the change in the 98% VaR as compared to the prior 30 days, assuming that all of the lowest 10 observations are still within the 300-day long historical window?

A. Unchanged.

B. VaR has increased by 0.01%.

C. VaR has increased by 0.08%.

D. VaR has increased by 0.11%.

Q.3307 Bank A manages interest rate risk by monitoring the VaR calculated using historical data. Bank A collects interest rate returns for 300 days and the data is sorted ascendingly. The lowest 10 interest rate returns are -4.2%, -4.0%, -3.8%, -3.2%, -3.0%, -2.5%, -2.3%, -2.2%, -2.0%, -1.7%. Calculate the 98% VaR.

A. -2.0%

B. -2.2%

C. -2.5%

D. -2.4%

Q.3313 An option on the INMEX (Mexican) stock index is struck on 2,522 pesos. The delta of the option is 0.6, and the annual volatility of the index is 25%. Using delta-normal assumptions, what is the 10-day VaR of the option at the 95% confidence level? Assume 260 days per year.

A. 204 pesos

B. 61.0 pesos

C. 115.8 pesos

D. 122.4 pesos

Q.3314 A futures contract on the S&P 500 is defined as a dollar multiple of the index level. The S&P 500 future traded on the Chicago Mercantile Exchange is defined as a $250 index. The 1% VaR of the S&P 500 index is 2.45. What is the 1% VaR of the S&P 500 futures contract?

A. $61.25

B. $512.50

C. $612.50

D. $1,225

Q.3316 Consider a non-linear portfolio that depends on a share price. Given that delta and gamma of the portfolio are 20 and 2.5, respectively. All else constant, what is the corresponding portfolio change to a stock price increase of $ 0.5?

A. $ 9.45

B. $ 10.63

C. $ 9.38

D. $ 10.31

Q.3318 You have been asked to estimate the VaR of GreenWood Corp. The company's stock is currently trading at USD 308 and the stock has a daily volatility of 1.25%. Using the delta-normal method, the VaR at the 95% confidence level of a long position in an at-the-money put on this stock with a delta of -0.5 over a 1-day holding period is closest to:

A. USD 3.12

B. USD 2.15

C. USD 3.167

D. USD 4.52

Q.3320 A market risk manager has gathered historical P&L data for his financial institution over the last 100 days. He intends to determine the VaR and the conditional VaR (CVaR) at 90% level of confidence using the historical simulation method. The worst 15 observation gathered (in million CAD) are:
[-25, -27, -27, -28, -30, -32, -36, -38, -40, -43, -45, -52, -56, -58, -60]

Calculate the VaR and the conditional VaR (CVaR).

A. VaR = 30; Conditional VaR = 46.

B. VaR = 32; Conditional VaR = 47.6.

C. VaR = 36; Conditional VaR = 47.6.

D. VaR = 32; Conditional VaR = 46.

Q.3394 A liquid asset K has a profit/loss distribution that's independent and identically distributed. The position has a one-day VaR of $50,000 at the 95% level of confidence. Estimate the 10-day VaR of the same position at the 99% level of confidence.

A. $115,114

B. $70,000

C. $223,956

D. $200,000

Q.3395 Peter McLeish is a risk analyst at Quantum Bank. After estimating the 99%, one-day VaR of the bank's portfolio using historical simulation with 900 past days, he is concerned that the VaR is providing too little information on tail losses. He embarks on a deeper examination of simulation results. Sorting the simulated daily P&L from worst to best, he constructs the following table:

P & L Rank	1	2	3	4	5
	−2,000	−1,860	−1,800	−1,720	−1,630
P & L Rank	6	7	8	9	10
	−1,500	−1,400	−1,310	−1,260	−1,190
P & L Rank	11	12	13	13	15
	−1,110	−1,050	−990	−820	−750

Determine the 99%, one-day expected shortfall of the portfolio:

A. 1,260

B. 1,653

C. 1,190

D. 1,609

Q.4665 Which of the following is **NOT** true about the historical simulation method of estimating VaR?

A. This method estimates VaR by using a lookback period.

B. This method assumes that the past performance of a portfolio is a good indicator of the near future.

C. This method assumes asset price returns and volatility follow a normal distribution.

D. All of the above.

Q.4667 The following are hypothetical ten worst returns for stock TGB from 120 days of data. Find the 1-day 95% VaR and expected shortfall, respectively. -15.72%, -10.92%, -6.50%, -3.56%, -6.90%, -2.50%, -5.30%, -4.31%.,-12.12%, -3.45%,

A. 0.053, 0.1043

B. 0.056, 0.0958

C. 0.0431, 0.1149

D. 0.0431, 0.0958

Q.4668 Consider a linear portfolio consisting of short positions in 50 shares, each worth USD 10, and a long position in 150 shares each worth USD 25. What is the relative portfolio change (in USD) of the portfolio if the price of all shares increases by 2%?

A. 85

B. -85

C. 65

D. -65

Q.4669 In a historical simulation where the risk factor is the stock price, 501-day recent historical data was used to generate 500 scenarios. From the data, the stock price on days 0, 1, 2, 300, ..., 500 are given as USD 20, USD 30, USD 28, USD 26,..., USD 36, respectively. What is the value of the stock price on the 501st day?

A. 40

B. 30

C. 50

D. 54

Q.4670 Given that the one-day standard deviation of a portfolio is 90, what is the 10-day VaR with a 99% confidence level according to the delta-normal model?

A. 604

B. 505

C. 662

D. 645

Q.4671 Given that the standard deviation of portfolio change is 90, what is the 10-day expected shortfall with a 99% confidence level according to the delta-normal model?

A. 640

B. 759

C. 650

D. 749

Q.4674 In the context of the delta-normal model, which of the following statements is **true**?

I. The delta-normal approach assumes that there is a linear relationship between the portfolio changes and risk factor changes.
II. The delta normal approach does not consider the curvature of the relationship between the portfolio value and the corresponding risk factors.
III. Compared to other VaR computation methods, the delta-normal approach is more accurate since it is easily calculated and assumes a normal distribution.

A. I and II

B. II only

C. III only

D. I and III

Q.4675 A risk manager conducts 500 historical simulations to calculate one day, 99% VaR. Which of the following describes the value of VaR in this case?

A. VaR would be the fifth-worst loss.

B. VaR would be the average of first, second, third, and fourth-worst losses.

C. VaR would be the sixth-worst loss.

D. VaR would be the average of the fifth and sixth loss.

Q.4676 The 100-day 99% VaR for a portfolio is 50. What is the corresponding 250-day 99% VaR?

A. 80.54

B. 65.25

C. 79.06

D. 78.54

Q.4677 A risk manager realizes over a period of one month, a portfolio he manages increased by USD 5 when the stock price increased by USD 0.1.What is the value of portfolio delta?

A. 30

B. 50

C. 40

D. 20

Q.4678 A risk manager estimates 10-day 95% VaR using the delta-model to be USD 50. What is the corresponding one-day expected shortfall at a 95% confidence level?

A. 66.78

B. 56.78

C. 19.82

D. 94.56

Q.4679 Correlation breakdown is a condition wherein periods of high volatility; correlations tend to be different as compared to normal market conditions. What implication does the correlation breakdown has on VaR and ES?

A. Calculation of VaR and ES should concentrate on what happens in extreme market conditions.

B. Calculation of VaR and ES should concentrate on what happens in normal market conditions.

C. Calculation of VaR and ES should concentrate on what happens in both normal and extreme market conditions.

D. All of the above.

Q.4680 Risk factors in a historical simulation of calculating VaR are divided into those where percentage change in the past is used to determine a percentage in the future and those where the actual change in the past is used to define the actual changes in the future. Which of the following risk factors are **NOT** in the same group?

I. Interest rates and credit spreads
II. Exchange rates and stock prices
III. Interest rates and exchange rates
IV. Stock prices and credit spreads

A. I, II and III

B. III and IV

C. II and IV

D. I and III

Q.4681 You have been given the following 30 ordered percentage returns of an asset: [-18,-16,-14,-12,-10,-9,-7,-7,-6,-6,-6,-5,-5,-4,-4,-4,-2,-1,0,0,2,3,6,12,12,13,15,15,18,28] What is the expected shortfall at a 90% confidence level?

A. 16

B. 17

C. 18

D. 17.5

Reading 47: Measuring and Monitoring Volatility

Q.535 Consider the following statements regarding the estimation of volatility:
I. Under the EWMA model, the weights attached to observations decrease following an exponential pattern as the observations become older
II. Under the GARCH(1,1) model, the observation's estimated weights decrease following an exponential pattern as the observations become older
III. Under the GARCH(1,1) model, the long-run average variance rate has some positive weight
IV. Under the EWMA model, the long-run average variance rate has some positive weight

A. All the above statements are correct.

B. Only I, II, and III are correct.

C. Only I and IV are correct.

D. None of the above statements are correct.

Q.536 Using a daily RiskMetrics EWMA model with a decay factor $\lambda = 0.85$ to develop a forecast of the conditional variance, which weight will be applied to the return that is three days old?

A. 0.1084

B. 0.0921

C. 0

D. 0.153

Q.537 Until December 2012, the Kenyan shilling had shown very small historical volatility against the South African Rand. On December 19th, Kenya abandoned the defense of the currency peg. Assuming the data from the close of business on December 19th, which of the following methods of calculating volatility would have shown the greatest jump in measured historical volatility?

A. 150-day equal weight

B. 100-day equal weight

C. Exponentially weighted with a decay factor of 0.92

D. Exponentially weighted with a decay factor of 0.97

Q.538 Given that σ_t^2 is the estimated variance at time t and μ_t is the realized return at time t, select the GARCH(1,1) model that will take the longest time to revert to its mean.

A. $\sigma_t^2 = 0.05 + 0.03\mu_{(t-1)}^2 + 0.91\sigma_{(t-1)}^2$

B. $\sigma_t^2 = 0.03 + 0.03\mu_{(t-1)}^2 + 0.92\sigma_{(t-1)}^2$

C. $\sigma_t^2 = 0.07 + 0.02\mu_{(t-1)}^2 + 0.94\sigma_{(t-1)}^2$

D. $\sigma_t^2 = 0.03 + 0.04\mu_{(t-1)}^2 + 0.91\sigma_{(t-1)}^2$

Q.539 Martin Scholes, FRM, estimates daily variance h_t using the following GARCH model on daily returns r_t:

$$H_t = \alpha_0 + \alpha_1 r_{(t-1)}^2 + \beta h_{(t-1)}$$

Where $\alpha_0 = 0.004, \alpha_1 = 0.05, \beta = 0.93$Approximate the long-run annualized volatility (Assume there are 252 trading days in a year).

A. 0.20

B. 7.144

C. 0.45

D. 0.5

Q.540 Consider the GARCH(1,1) model:

$$\sigma_t^2 = \omega + \alpha\mu_{(t-1)}^2 + \beta\sigma_{(t-1)}^2$$

Where $\alpha + \beta < 1$Which of the following statements is INCORRECT regarding the volatility term structure predicted by the model above?

A. If we assume that the long-run estimated variance remains unchanged as α and β increase, the volatility term structure predicted by the model reverts to the long-run estimated variance faster.

B. If we assume that the long-run estimated variance remains unchanged as α and β increase, the volatility term structure predicted by the model reverts to the long-run estimated variance more slowly.

C. If the current volatility estimate is above the long-run average volatility, we would expect the estimated volatility term structure to be downward-sloping.

D. If the current volatility estimate is below the long-run average volatility, we would expect the estimated volatility term structure to be upward-sloping.

Q.541 A risk manager at Meridian Bank uses the exponentially weighted moving average technique to model the daily volatility of a security, with λ equal to 0.95. The current daily volatility estimate stands at 1.8%. On a certain day, the security registers a closing price of $10 and then $8 the following day. Determine the updated estimate of volatility:

A. 22.31%

B. 5.29%

C. 15.21%

D. 18.12%

Q.542 Consider a portfolio with 60% invested in asset Y and 40% invested in asset Z. The mean and variance of the return on Y are 0 and 49 respectively. The mean and variance of the return on Z are 1 and 84 respectively. Given that the correlation coefficient between Y and Z is 0.4, determine the portfolio volatility.

A. 43.4

B. 6.59

C. 8.5

D. 23.1

Q.543 A FRM exam candidate uses the EWMA model with a decay factor of 0.90 to model the returns of a security listed on the Japanese Stock Exchange. Determine the weight that will be applied to the return that's 5 days old.

A. 0.04656

B. 0.09

C. 0.06

D. 0.0656

Q.544 The decay factor used in an EWMA model is approximated to be 0.97. In addition, daily volatility is estimated to be 1%. Given that today's stock market return is 3%, determine the new estimate of volatility using the EWMA model.

A. 0.00027

B. 0.000124

C. 0.01114

D. 0.00567

Q.545 A generalized autoregressive conditional heteroskedastic (GARCH)(1,1) model has the following parameters: $\omega = 0.000003; \alpha = 0.05; \beta = 0.94$Determine the implied long-run volatility level.

A. 0.0003

B. 0.07132

C. 0.02732

D. 0.01732

Q.546 The dollar/sterling exchange rate at 5 P.M. yesterday was 0.78 and the most recent estimate of the daily volatility stands at 0.8%. The EWMA model used in the analysis has $\lambda = 0.9$. If the exchange rate at 5 P.M. today proves to be 0.775, find an estimate of the new daily volatility.

A. 0.007857

B. 7.855E-05

C. 6.4E-05

D. 6.17E-05

Q.547 An analyst has interest in two assets, A and B. At the close of business yesterday, these assets had daily volatilities of 1.3% and 2.0% respectively. In addition, the assets were priced at $40 for A and $80 for B as at the close of business yesterday, and the estimated correlation coefficient between the two assets stood at 0.25. The EWMA model used by the analyst had $\lambda = 0.95$.
Compute an estimate of the covariance between A and B.

A. 0.000065

B. 0.0006

C. 2.60005

D. 0.05

Q.548 An analyst has interest in two assets, A and B. At the close of business yesterday, these assets had daily volatilities of 1.3% and 2.0% respectively. In addition, the assets were priced at $40 for A and $80 for B as at the close of business yesterday, and the estimated correlation coefficient between the two assets stood at 0.25. The EWMA model used by the analyst had $\lambda = 0.95$.
Assuming that the prices of the assets today are $40.5 and $80.5, update the correlation coefficient.

A. 0.00625

B. 0.01954

C. 6.56E-05

D. 0.2589

Q.549 GARCH(1,1) models can be used to estimate the volatility of asset returns if and only if:

A. $\alpha > \beta$

B. $\alpha < \beta$

C. $\alpha + \beta = 0$

D. $\alpha + \beta < 1$

Q.556 Robert Kelly, FRM, uses the EWMA model to carry out daily updates of correlation and covariance rates between two random variables X and Y. The weight for the most recent covariance on day $n-1$ is 0.80. The correlation estimate between X and Y on day $n-1$ is 0.6. In addition, on day $n-1$, X and Y have estimated standard deviations of 0.013 and 0.019 respectively. Also, the percentage change on day $n-1$ for variables X and Y are 2% and 1% respectively.Calculate the updated covariance between X and Y on day n.

A. 0.0125

B. 0.41

C. 0.0001586

D. 0.0001482

Q.557 Robert Kelly, FRM, uses the EWMA model to carry out daily updates of correlation and covariance rates between two random variables X and Y. The weight for the most recent covariance on day $n-1$ is 0.80. The correlation estimate between X and Y on day $n-1$ is 0.6. In addition, on day $n-1$, X and Y have estimated standard deviations of 0.013 and 0.019 respectively. Also, the percentage change on day $n-1$ for variables X and Y are 2% and 1% respectively.Compute the updated correlation between X and Y

A. 0.1586

B. 0.2152

C. 0.3088

D. 0.6152

Q.558 A financial analyst uses daily data to estimate a GARCH (1,1) model as follows:

$$\sigma_n^2 = 0.000002 + 0.16r_{n-1}^2 + 0.74\sigma_{n-1}^2$$

She also has established that the most recent return and variance are 0.04 and 0.02, respectively. Calculate the updated volatility.

A. 1.51%

B. 11.11%

C. 3.33%

D. 12.27%

Q.565 A certain analyst uses the EWMA model with $\lambda = 0.9$ to carry out an update of correlation and covariance rates. On day $n-1$, the observed percentage changes for variables X and Y are 3% and 2% respectively. Historical data puts the correlation estimate between A and Y at 0.54 on day $n-1$. Furthermore, the estimated standard deviations on day $n-1$ are 1.2% and 1.4% for X and Y respectively.
Compute the new estimate of the covariance between X and Y on day n.

A. 9.07205

B. 0.1234

C. 0.1416

D. 0.0001416

Q.566 A certain analyst uses the EWMA model with $\lambda = 0.9$ to carry out an update of correlation and covariance between the returns of two assets - A and B. The analyst observes that on day n - 1, the return on A is 2% and that on B is 3%, and the correlation between A and B is 0.5. In addition, the volatilities of the return on X and Y are 1% and 2%, respectively. Estimate the new coefficient of correlation.

A. 0.55

B. 0.62

C. 0.45

D. 0.5

Q.567 The following is a variance-covariance matrix:

$$\begin{bmatrix} 1 & 0 & 0.7 \\ 0 & 1 & 0.7 \\ 0.7 & 0.7 & 1 \end{bmatrix}$$

Determine the correlation rate between variables 2 and 3.

A. 0.7

B. 1

C. 0.49

D. 0

Q.568 Kelvin Klein, a financial analyst, uses daily data to estimate a GARCH (1, 1) model as follows:

$$\sigma_n^2 = 0.000002 + 0.14r_{n-1}^2 + 0.76\sigma_{n-1}^2$$

Kelvin establishes that the estimate of return on day $n-1$ is 0.02 and the most recent observation on variance is 0.01. Calculate the updated estimate of variance, σ_n^2

A. 0.066

B. 0.008

C. 0.088

D. 0.017

Q.940 A number of risk measures are based on the parametric approach, which assumes that the asset returns are normally distributed. However, mathematicians and statisticians have discovered that in reality, the asset returns deviate from normality. Which of the following options is least likely consistent with the assumption that the asset returns deviate from normality?

A. Asset returns have fat-tailed distributions which means assets have a higher probability weight in their tails relative to the normal distribution.

B. Asset returns have skewed distribution, which means that the declines in asset prices are more severe than increases in prices.

C. Asset returns have unstable parameter values due to varying market conditions.

D. Asset returns have symmetrical distributions which means they are evenly distributed around the mean returns.

Q.941 Donald York is a quantitative analyst at Brooklyn Investments Hub, a tech investment company based in New York. York brings 5 years of experience in quantitative and statistical analysis. In one of his explanatory articles, he mentioned that when the mean and standard deviation of asset returns are the same for any given time period, the distribution of returns is said to be an unconditional distribution. In contrast, if the mean is the same at any time while the standard deviation of the return change over time, the return distribution is referred to as a conditional distribution. Identify the correct option from the following.

A. York's explanation regarding the unconditional distribution is incorrect.

B. York's explanation regarding the conditional distribution is incorrect.

C. York's explanation regarding the conditional and unconditional distribution is incorrect.

D. York's explanation regarding the conditional and unconditional distribution is correct.

Q.942 An analyst is conducting fundamental and technical analysis on Pak-China Trading Co (PCTC) stocks. The analysis takes into account the stock's daily returns based on the mean and volatility of returns. If PCTC returns have a mean of 9.56 bps/day, and a high volatility of 14.25 bps/day and a low volatility of 6.18 bps/day, then determine which of the following distributions fits the most the characteristics of PCTC's return distribution?

A. Unconditional distribution.

B. Regime-switching distribution.

C. Unconditionally lognormal distribution.

D. Conditional distribution.

Q.947 Gareth Graham is a senior risk consultant for Poincare Consulting Group. Graham has a strong reputation in the risk managers community, which is why he is frequently invited as a guest speaker at various business schools. During a recent seminar at a reputable business school in Vancouver, Graham mentioned the following comments regarding the cyclicality of volatility:
I. It should be considered while analyzing the risk of financial assets that volatility in financial markets is time-varying
II. While using a historical data model for analyzing volatility, more weight should be put into recent data as opposed to earlier data

Which of the following is correct?

A. Only statement I is correct.

B. Only statement II is correct.

C. Both statements are correct.

D. None of the statements is correct.

Q.948 An analyst is comparing the STDEV or GARCH methodology with that of the RiskMetric® approach for estimating VaR using historical data. He wrote down the following similarities between both methods. Which of the following similarities is incorrect?

A. Both methods belong to the parametric class of risk assessing models.

B. Both methods attempt to estimate conditional volatility.

C. Both methods apply equal weights to all the periods.

D. Both methods use recent historic data for assessing risk.

Q.951 Selma Kaya is a junior risk analyst at Galileo Investment Bank. She is interested in estimated the joint density of returns of Algo Corp. and economic growth. Which of the following models should Kaya most likely use?

A. Risk Metric®.

B. Black-Scholes model.

C. GARCH.

D. Multivariate density estimation (MDE) model.

Q.953 Markus Schmidt is an independent risk consultant at a well-known audit firm. He is currently working as an external risk advisory for George Reed Shipping Inc. During a meeting with the senior management of the shipping company, Schmidt made the following comments:
I. Using nonparametric is a simple process as it does not impose a specific set of distributional assumptions; rather it uses the historical data directly
II. Nonparametric methods are better predictors of the future volatility

Which of his comments is/are incorrect?

A. Comment I only.

B. Comment II only.

C. Both comments.

D. None of the comments.

Q.956 If the covariance between Japanese and English interest rates is 0.089, and the variances of interest rates in Japan and England are 17.64% and 10.24%, respectively, then which of the following is closest to the correlation between Japanese and English interest rates?

A. 4.927

B. 1.028

C. 0.6622

D. 0.8736

Q.3301 An investment company uses RiskMetrics to calculate the volatility. The volatility for the previous day is 0.02 and today's return is 10%. What is the updated volatility if $\lambda = 0.97$ is used?

A. 0.0028

B. 0.0194

C. 0.0262

D. 0.053

Q.3302 A hedge fund manages risk by calculating future volatility using RiskMetrics^{TM} to calculate the volatility. The volatility of the portfolio today is 3% per day and today's observed return is 1%. The conditional volatility estimate, assuming that $\lambda = 0.9$, is closest to:

A. 2.86%

B. 3.49%

C. 2.50%

D. 3.21%

Q.3303 A hedge fund manages risk by calculating future volatility using historical standard deviation. The portfolio performance in the past 5 days are 2% (n-1), 4% (n-2), 6% (n-3), 2% (n-4), and 10% (n-5), respectively. The hedge fund uses the historical standard deviation (moving average) method to calculate volatility. What is the volatility estimate?

A. 4.00%

B. 5.66%

C. 3.40%

D. 2.80%

Q.3304 Suppose that λ is 0.97. Using the EWMA approach, what is the weight applied to the squared return on day $n-3$?

A. 0.4

B. 0.97

C. 0.03

D. 0.06

Q.3308 For a certain asset, the expected one-period volatility is 0.002. If the speed of the reversion parameter is 0.7, then what is the two-period volatility?

A. 0.002

B. 0.0024

C. 0.0115

D. 0.0587

Q.3310 For a certain asset, the expected one-day volatility 0.002. What is the expected volatility for 30 days assuming non-predictability and the volatility being constant?

A. 0.002

B. 0.005

C. 0.011

D. 0.021

Q.3377 The parameters of a generalized autoregressive conditional heteroskedastic (GARCH)(1,1) model are $\alpha = 0.05$, $\beta = 0.91$. Long-run volatility is 0.80%. If estimated daily volatility is 2% and recent stock return is 3%, compute the new estimated volatility using the GARCH (1,1) model.

A. 0.04%

B. 2.50%

C. 1.50%

D. 2.03%

Q.3378 The decay factor of exponentially weighted moving average (EWMA) model is estimated to be 0.95. If the estimated daily volatility is 2% and the recent stock return is 3%, compute the new estimated volatility using the EWMA model.

A. 2.06%

B. 2.03%

C. 0.04%

D. 2.50%

Q.3379 When parameters of a generalized autoregressive conditional heteroskedastic (GARCH)(1,1) model are set to $\omega = 0, \alpha = 1 - \lambda, \beta = \lambda$, the GARCH (1, 1) model reduces to a (an):

A. Generalized volatility model

B. EWMA model

C. ARCH (1)

D. None

Q.3380 The parameters of a generalized autoregressive conditional heteroskedastic (GARCH)(1,1) model are ω, α, β, and γ. Which of the following is the necessary condition for estimating volatility using GARCH (1, 1)?

A. $\alpha > \beta$

B. $\gamma < 0$

C. $\alpha + \beta < 1$

D. $\alpha + \beta + \gamma > 1$

Q.3383 An analyst is trying to updates the estimated covariance by using the exponentially weighted moving average (EWMA) model with $\lambda = 0.91$. The analyst has gathered the following relevant data.

- Estimated standard deviation on day $n-1$ for variables X : 2%
- Estimated standard deviation on day $n-1$ for variables Y : 3%
- The correlation between them: 0.8
- The percentage change on day $n-1$ for variable X : 2.5%
- The percentage change on day $n-1$ for variable Y : 3.5%

What is the updated estimated covariance between them?

A. cannot be estimated

B. 0.00051000

C. 0.00048000

D. 0.00051555

Q.3384 An analyst is trying to updates the estimated covariance by using the exponentially weighted moving average (EWMA) model with $\lambda = 0.91$. The analyst has gathered the following relevant data.

- Estimated standard deviation on day $n-1$ for variables X : 2%
- Estimated standard deviation on day $n-1$ for variables Y : 3%
- The correlation between them: 0.8
- The observed return on day $n-1$ for variable X : 2.5%
- The observed return on day $n-1$ for variable Y : 3.5%

Given that the new Covariance between X and Y is 0.00051555, what is the updated estimated correlation between them?

A. 0.825

B. 0.800

C. 0.910

D. None

Q.3385 Suppose that an analyst has gathered the following relevant data for estimating updated covariance using the EWMA model:

- Estimated standard deviation on day $n-1$ for variables X : 2%
- Estimated standard deviation on day $n-1$ for variables Y : 3%
- The correlation between them: 0.8
- The percentage change on day $n-1$ for variable X : 25%
- The percentage change on day $n-1$ for variable Y : 35%

Assuming that we choose $\lambda = 0.96$, what is the updated estimated covariance between variables X and Y using the EWMA model?

A. 0.00041

B. 0.00048

C. 0.08402

D. 0.003961

Q.3386 The parameters of a generalized autoregressive conditional heteroskedastic (GARCH)(1,1) model are $\alpha = 0.05$; and $\beta = 0.91$. The long-run average variance rate is 0.80%. The analyst has gathered the following relevant data for estimating updated covariance using the GARCH(1, 1) model.

- Estimated standard deviation on day $n-1$ for variables X : 2%
- Estimated standard deviation on day $n-1$ for variables Y : 3%
- The correlation between them: 0.8
- The return observed on day $n-1$ for variable X : 2.5%
- The return observed on day $n-1$ for variable Y : 3.5%

What is the updated estimated correlation between the two variables using EWMA model with $\lambda = 0.96$?

A. 0.8840

B. 0.4500

C. 0.5351

D. 0.9270

Q.4659 If the daily volatility of the price of gold is 0.3% in a given year, and assuming that a year has 252 trading days, what is the annualized volatility of the gold price? (Assume that there are 252 trading days in a year)

A. 0.0467

B. 0.0356

C. 0.0476

D. 0.0120

Q.4661 A stock market investor records the stock price for five consecutive days as 20.20, 20.00, 21.20, 21.00, and 23.30. Estimate the daily volatility using the stock price returns?

A. 10.25%

B. 5.6%

C. 11.45%

D. 12.56%

Q.4662 Consider a GARCH (1,1) model with $\omega=0.00005$, $\alpha=0.025$, and $\beta=0.90$, what is the value of long-run average volatility?

A. 0.0245

B. 0.0258

C. 0.0051

D. 0.00735

Q.4663 The current volatility for stock prices is estimated to be 4% per day, and the corresponding long-run average volatility is 3%. Assuming the GARCH (1,1) model with $\omega=0.00005$, $\alpha=0.025$, and $\beta=0.90$, what is volatility estimate in 50 days?

A. 0.0009

B. 0.0393

C. 0.0302

D. 0.0275

Q.4664 An investor notes that the closing stock price for asset A yesterday was USD 50, with a corresponding volatility if 2.5% per day. Similarly, the closing stock price for asset B was USD 30, with a corresponding volatility of 1.5% per day. Today, the stock price for asset A closed at USD 45, and that of B closed at USD 35. The correlation coefficient between the stocks A and B on close of trading yesterday was 0.55.
Using the EWMA model with $\lambda=0.85$, what is the updated correlation coefficient between stocks A and B?

A. 0.64

B. -0.64

C. 0.78

D. -0.78

Reading 48: External and Internal Credit Ratings

Q.1041 Which of the following statements is INCORRECT with regard to credit ratings?

A. A credit rating represents the agency's opinion about the creditworthiness of an obligor with respect to a particular debt security or other financial obligation.

B. Credit rating also applies to an issuer's general creditworthiness.

C. There are generally two types of assessment corresponding to different financial instruments: short term and long term.

D. Credit ratings from different agencies convey the same information.

Q.1042 Which of the following statements is NOT true regarding the rating process?

A. The criteria according to which any assessment is provided are very strictly defined and constitute the intangible assets of rating agencies.

B. The rating agency reviews qualitative as well as quantitative factors and compares the company's performance with that of its peers.

C. The issuer is notified of the rating and the major considerations supporting it before it is discussed by the rating committee.

D. When a rating is put on a credit watch list, a comprehensive analysis is undertaken.

Q.1043 The rating "outlook" provides information about the:

A. Rating trend.

B. Loss severity independent of probability of default.

C. Loss severity given the probability of default.

D. Probability of default.

Q.1044 Which of the following factor is part of the quantitative analysis of rating of an industrial company?

A. Business fundamentals.

B. Operations and cost control.

C. Financial ratios.

D. Both A and B.

Q.1045 The rating of an issuer provided by a rating agency is a (an):

A. Mere opinion on the issuer or securities issued by the issuer.

B. Recommendation to purchase, sell, or hold any types of security.

C. Indicator of the issuer's creditworthiness and also gives the price or relative value of specific securities.

D. Recommendation based on quantitative analyses and business reviews.

Q.1046 Which of the following statements is true with regard to the relationship between ratings and probabilities of default?

A. Across all industries, the number of defaults monotonically increases as we move down the credit rank.

B. A given rating is meant to be forward-looking; it is devised to pinpoint a precise probability of default.

C. Ex-post information such as that provided in default tables or transition matrices does guarantee to provide ex-ante insights regarding future probabilities of default or migration.

D. Both A and B.

Q.1047 Through-the-cycle ratings issued by the rating agencies do NOT:

A. Because of their low volatility, ttc ratings help financial institutions to better manage customers.

B. Mitigate the effect of cycles on ratings by incorporating the effect of an “average cycle” in their scenarios.

C. Fluctuate much with temporary changes in microeconomic conditions.

D. Indicate probabilities of default over a wide time horizon..

Q.1048 Which of the following statement is most likely to be true with regard to the impact of a rating downgrade/upgrade on the price of bonds/stocks?

A. A rating downgrade is somewhat likely to increase the price of a bond.

B. A rating downgrade is likely to decrease the price of a bond.

C. A rating upgrade is unlikely to increase the price of the stock since the price only reflects the earnings expectations of investors.

D. A rating downgrade is unlikely to decrease the price of a stock since the price largely reflects earnings expectations among consumers.

Q.2810 The CRO of an investment bank is reviewing the internal rating assessment policies. He notices that the bank is using the through-the-cycle approach to rate the borrowers. He is concerned about the effectiveness of the current approach during recessions and asks to compare it with the at-the-point-in-time approach.Which of the following statements is correct?

A. During recessions, the through-the-cycle approach tends to over-estimate risk during recessions.

B. During recessions, the at-the-point-in-time approach tends to over-estimate risk during recessions.

C. During recessions, both through-the-cycle and at-the-point-in-time approaches tend to over-estimate risk.

D. During recessions, both through-the-cycle and at-the-point-in-time approaches tend to under-estimate risk.

Q.2811 Greg Teller, a credit risk analyst, was requested by the CRO to check an internal rating transition matrix prepared by an intern. The matrix is based on actual rating migrations over the last ten years. The bank has ratings of A, B, C, and D, with A representing the highest credit quality and D representing a default. The bank currently has a rating of C. The intern prepares the following table:

Annual Rating Transitions (%, Average Annual)

	A	B	C	D
A	95.00	3.00	2.00	–
B	2.00	89.00	5.00	2.00
C	–	7.00	83.00	10.00

After a short review, Teller makes the following statement to the CRO: Statement 1: "The internal rating transition matrix is correct." He also decides to incorporate the findings from the matrix in the conclusion of his research report for LLL Construction (the only C-rated borrower of the bank). He includes the following sentence in the conclusion of the report: Statement 2: " The risk management department recommends creating significant loan loss provisions for LLL's facility as it has a 10% chance of default with the current rating and a 0% chance of improvement to an A rating over the longer term." Are Teller's statements correct?

A. Statement 1 is correct while statement 2 is incorrect.

B. Statement 1 is incorrect while statement 2 is correct.

C. Statement 1 is correct, and statement 2 is also correct.

D. Statement 1 is incorrect, and statement 2 is also incorrect.

Q.3436 Simon Bryan, FRM, is scrutinizing historical migration tables published by S&P's and Moody's. Which of the following statements would possibly appear under "additional information" below such tables?

A. We should expect to see the highest level of rating stability in the intermediate term (five-year time frame). Risk ratings will tend to have changed more at both the one- year and ten-year horizons.

B. We should expect to see the highest level of rating stability during the one-year timeframe. This stability will decline at both the five-year time frame and even more so at the ten-year horizon.

C. We should expect to see the greatest amount of credit rating stability over long periods of time (e.g., ten years). Credit ratings will tend to change more during shorter periods of time.

D. We should expect to see credit ratings change by about the same amount over time. The ratings transition matrix shows approximately the same figures for the one-year, five-year, and ten-year time horizons.

Q.3437 ANEX Financials (AF), a U.S. based firm, has just issued a two-year zero-coupon bond currently rated AA. Market analysts expect that one year from now:

- The probability that the rating of AF remains at AA is 90%
- The probability that the rating of AF is downgraded to A is 5%
- The probability that AF is upgraded to AAA is 5%

The risk-free rate is flat at 2%, and credit spreads for AAA-, AA-, and A-rated debt are flat at 40, 60, and 100 basis points, respectively. All rates are compounded annually. What is the best approximation of the expected value of the zero-coupon bond a year from today?

A. 97.6

B. 97.5

C. 97.7

D. 97.4

Q.3438 Rating agencies make efforts to incorporate the effects associated with an economic cycle in their ratings. Although this practice is generally valid, it may lead to:

A. Underestimation of the probability of default in an economic recession

B. Overestimation of the probability of default in an economic recession

C. Underestimation of the probability of default in an economic expansion

D. Divergence of the interests of agency analysts and those of management

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Q.4682 Given a constant hazard rate of 0.02, what is the survival probability until year 3?

A. 0.9674

B. 0.9418

C. 0.9518

D. 0.942

Q.4683 Suppose a firm has a debt of $20 million. If the recovery rate is 80%, and that there is a 0.03 chance that the loan will default, what is the expected loss when the loan defaults?

A. 0.12m

B. 0.15m

C. 0.09m

D. 0.06m

Q.4684 Consider a firm in which the following information rations

i. Working capital to total assets = 0.32
ii. Retained earnings to total assets = 0.44
iii. Earnings before interest and taxes to total assets = 0.80
iv. Market value of equity to book value of total liabilities = 1.2
v. Sales to total assets = 1.8

What is the Altman's Z-score for the firm?

A. 6.235

B. 6

C. 6.1582

D. 6.2543

Q.4685 Suppose the hazard rate for the first three years is 0.01 and the hazard rate for the next three years is 0.02. What is the probability of default between years 3 and 6?

A. 0.0421

B. 0.0565

C. 0.9434

D. 0.9579

Q.4686 Suppose that company XYZ has a debt value of $100m and that the value of its assets is $120m. What is the value of the equity at that future point in time?

A. 0

B. 20m

C. min(20m,0)

D. 83.33m

Q.4687 Suppose v is the value of the asset, and d is the value of the debt, the firm defaults when:

A. $v < d$

B. $v > d$

C. $v = d$

D. $max(v - d) > d$

Reading 49: Country Risk

Q.1029 Armenia Bank has opened a new branch in a country where political risk is substantial. The board of the bank would like to get a report from the risk department on political risks likely to be faced in other countries. The risk department, while presenting the report, makes the following statements:
Statement I: Democratic countries are always less risky than dictatorship countries
Statement II: The chaos of democracy does create more discontinuous risk (policies that change as governments shift), and dictatorships create more continuous risk
Statement III: Corruption is an implicit tax on income (that does not show up in conventional income statements as such) that reduces the profitability and returns on investments for businesses in that country directly and for investors in these businesses indirectly
Statement IV: Countries that are in the midst of physical conflicts, either internal or external, will expose investors/businesses not only economic costs but also physical costs

Which of these statements are true?

A. II, III & IV only.

B. II & III only.

C. III & IV only.

D. All of the above.

Q.1030 Simon Fernando, a country risk intern working at Cross Country Ratings Limited, is preparing a report on services measuring country risk. He lists out the following details in his report:
Statement I: The country scores used by different services are standardized
Statement II: A country with a risk score of 80 in the PRS scoring mechanism is twice as safe as a country with a score of 40
Statement III: Country risk scores are more useful for measuring relative risk than for ranking the countries.

Which of these statements are correct?

A. I only.

B. II & III only.

C. All of the above.

D. None of the above.

Q.1031 An analysis of country defaults has shown that:
I. Countries have been more likely to default on sovereign bonds issued than bank debt owed
II. In dollar value terms, Sub-Saharan countries have accounted for much of sovereign defaulted debt in the last 50 years
III. As per Moody's, countries are increasingly defaulting on foreign currency debt
IV. Defaults since the 1960s have been more likely on foreign currency debt than on foreign currency bonds
Which of the above statements are correct?

A. II, III & IV only.

B. I & II only.

C. III & IV only.

D. All of the above.

Q.1032 Country ABC recently defaulted on local currency and foreign currency sovereign debt. One of the economists of the country writes an article in the leading business weekly of the country and lists out the short term and long term effects of defaulting on debt:
I. Default has a negative impact on real GDP growth of between 0.5% and 2%
II. Default does affect a country's long-term sovereign rating and borrowing costs
III. Sovereign default makes banking systems more robust
IV. Sovereign default also increases the likelihood of political change

Which one of them is correct according to research materials available on the subject?

A. II, III & IV only.

B. I & II only.

C. I, II & IV only.

D. All of the above.

Q.1033 McGrath, a University student, is working on an article titled "Factors Determining Sovereign Default Risk." He sources data from around the world on sovereign default and analyzes the data. Finally, he compiles his findings based on his understanding and analysis of the data. He seeks your help in verifying the accuracy of his findings.
Statement I: Income tax-based systems generate more volatile revenues than sales tax (or value-added tax systems)
Statement II: The decision to default is as much a political decision as it is an economic decision
Statement III: Autocracies are more likely to default than democracies
Statement IV: The independence and power of the central bank will also affect assessments of default risk

Which of these statements are accurate?

A. II, III & IV only.

B. I & II only.

C. I, II & IV only.

D. All of the above.

Q.1034 An analysis of the sovereign ratings provided by different rating agencies reveals that:
I. For the most part, there is a consensus among the rating agencies in the ratings, but there can be significant differences on individual countries
II. Sovereign ratings change over time but far less than corporate ratings do
III. Sovereign ratings change little on an annual basis for higher-rated countries compared to lower-rated countries
IV. Rating agencies assess risk at the broader regional level and have been accused of regional biases

Which of these are correct statements?

A. II, III & IV only.

B. I & II only.

C. I, II & IV only.

D. All of the above.

Q.1035 Three economists participate in a discussion on 'local and foreign currency sovereign ratings' on live television. The following are the opinions expressed by these economists on this topic:
Economist 1: The differential between foreign and local currency ratings is primarily a function of monetary policy independence
Economist 2: Countries that maintain floating rate exchange regimes and fund borrowing from deep domestic markets will see local currency ratings converge on foreign currency ratings
Economist 3: For the most part, local currency ratings are at least as high or higher than the foreign currency rating. There are, however, notable exceptions, where the local currency rating is lower than the foreign currency rating.

Which economist(s) made (an) accurate statement(s)?

A. Only Economist 3.

B. Only Economists 1 and 3.

C. Only Economist 1.

D. All three economists.

Q.1036 Each rating agency has its own system for estimating sovereign ratings, but the processes share a great deal in common. With regard to sovereign ratings provided by rating agencies and the processes followed by them, identify the correct statements.
I. A sovereign rating is focused on the creditworthiness of the sovereign country to private creditors and not to official creditors
II. Rating agencies also vary on whether their rating captures only the probability of default or also incorporates the expected severity
III. The ratings are decided by a vote of the committee
IV. News of a political coup or an economic disaster can lead to a rating review not just for the country in question but also for surrounding countries

A. II, III & IV only.

B. I & II only.

C. I, II & IV only.

D. All of the above.

Q.1037 Rating agencies have been criticized for failing investors on several counts in the case of sovereign ratings. Which of the following are accurate criticisms faced by rating agencies?
I. Rating agencies have been accused of being far too optimistic in their assessments of corporate rating as compared to sovereign ratings
II. When one rating agency lowers or raises a sovereign rating, other rating agencies seem to follow suit
III. Rating agencies take too long to change ratings, and these changes happen too late to protect investors from a crisis
IV. Once a market is in crisis, there is the perception that rating agencies sometimes overreact and lower ratings too much, thus creating a feedback effect that makes the crisis worse

A. II, III & IV only.

B. I & II only.

C. I, II & IV only.

D. All of the above.

Q.1038 Market interest rates and market-based default spreads play an important role in understanding sovereign ratings. Which of the following statements are true?
I. Market-based spreads are more dynamic than ratings, with changes occurring in real time
II. Market-based default measures tend to be far more volatile than ratings and can be affected by variables that have nothing to do with default
III. The sovereign bond market leads rating agencies, with default spreads usually climbing ahead of a rating downgrade and dropping before an upgrade
IV. Notwithstanding the lead-lag relationship, a change in sovereign ratings is still an informational event that creates a price impact on the sovereign bonds at the time that it occurs

A. II, III & IV only.

B. I & III only.

C. I, II & IV only.

D. All of the above.

Q.1039 Bank ABC relies on credit default swaps to assess the default risk of sovereign bonds/debt. Which of the following statements are true with regard to the relationship between Credit Default Swaps and default risk?

I. Changes in CDS spreads lead to changes in sovereign bond yields and sovereign ratings
II. The CDS market is quicker or better at assessing default risks than the government bond market, from which default spreads can be extracted
III. The exposure to counterparty and liquidity risk, endemic to the CDS market, can cause changes in CDS prices that have little to do with default risk
IV. The narrowness of the CDS market can make individual CDS susceptible to illiquidity problems, with a concurrent effect on prices

A. I, III & IV only.

B. I & III only.

C. I, II & IV only.

D. All of the above.

Q.1040 Country XYZ chooses to default in local currency. Which of the following may NOT be a compelling reason to default in local currency?

A. Following Gold standard in the decades prior to 1971.

B. Shared currency.

C. Foreign currency debt funding local currency assets.

D. Local currency debt funding foreign currency assets.

Q.2807 Aram Stone recently graduated from one of the most renowned German universities. During his time as an undergrad, Stone developed a unique algorithm that could completely change the development of Artificial Intelligence. Stone wants to patent his idea and initiate a startup, but he did not yet decide on the exact location. To evaluate legal risks, Stone found the rating presented in the table below:

Region	Overall Property Rights	Legal Property Rights	Physical Property Rights	Intellectual Property Rights
Central/Eastern Europe	4.78	4.64	5.47	4.22
Asia Oceania	4.77	4.42	5.44	4.44
Middle East & North Africa	4.76	4.61	5.42	4.26
Latin America	4.57	4.23	5.23	4.25
Africa	4.53	4.26	5.17	4.16
best protection <->highest scores				

In which of the below regions should Stone register his company and patent if his main concern is the protection of his algorithm?

A. Central/Eastern Europe

B. Asia & Oceania

C. Middle East & North Africa

D. Latin America

Q.3433 Mendoza Valeria, FRM, works as a risk analyst at a Mexican conglomerate. She has been asked to evaluate USD-based bond investments issued by four different companies. According to her employer's guidelines, the firm has a strict policy of only investing in companies with investment-grade ratings on both the S& P rating scale and Moody's. In addition, the firm only invests in countries with favorable sovereign risk quality. Assuming the company is located in the paired country, which (country, company) pair, as outlined below, would be the most appropriate investment?

Country	Import Ratio	Debt Service Ratio	Company	S&P Rating	Moody's Rating
Jolly World	42%	300%	Brighter World ltd.	A	Ba
Pluto	18%	30%	Green Leaf Corp	A	Aa
Northern Lights	8%	250%	Eastbrom Financial	BB	Baa
Norfork	30%	50%	Helsinki Inc.	BBB	Ba

A. (Norfork, Helsinki Inc.)

B. (Northern Lights, Eastbrom Financial)

C. (Pluto, Green Leaf Corp)

D. (Jolly World, Brighter World ltd.)

Q.3434 Credit rating agencies like S&Ps and Moody's issue two different credit ratings for countries with an appetite for debt. These are the local currency debt rating and the foreign currency debt rating. Historically, it has been observed that defaults on local-currency-denominated debt are less frequent than foreign-currency-denominated debt.
What's the main reason behind this observation?

A. Local currency debt has a lower spread compared to that of foreign debt

B. This is a statistical anomaly – ideally, defaults rates in the two categories of debt should be more or less equal

C. Foreign currency-denominated debt has fewer political ramifications than local currency-denominated debt, making it easier to deal with the consequences from the perspective of a country's leadership

D. Unlike local currency obligations, foreign currency obligations cannot be settled via monetary expansion

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Q.3435 Credit ratings have over the years been put to task for issuing credit ratings that do not accurately capture the risk associated with foreign debt owned by different countries around the world.
Which of the following statements is false regarding weaknesses of rating agency sovereign debt ratings?

A. Ratings are often reactive to real life happenings on the lending market

B. Rating agencies exhibit some interdependence while issuing credit ratings

C. Rating agencies use government-provided data to model default risk and come up with a credit rating

D. None of the above

Reading 50: Measuring Credit Risk

Q.561 The following is a structure of one-factor models between normally distributed variables, U_i:

$$U_i = a_i F + \sqrt{1 - a_i^2} Z_i$$

Which of the following is NOT a property of the above model?

A. Every U_i has a standard normal distribution with mean = 0 and standard deviation = 1.

B. Every Z_i is uncorrelated with each other.

C. The constant α_i is between 0 and 1.

D. F and Z_i have standard normal distributions.

Q.562 A copula is:

A. A joint probability distribution between two uniformly distributed random variables.

B. A joint probability distribution between two or more uniformly distributed random variables which still maintains their marginal distributions.

C. The product of the marginal distributions of two or more random variables.

D. A statistical tool that represents a multivariate distribution while still maintaining their individual marginal distributions.

Q.1051 Yusuf, a research scholar associated with Dale University, presents a report on expected loss to the senior management of Glovsky Bank. He makes the following statement(s) in his report:
Statement I: The expected loss is a certain amount of money a bank is expected to lose over a pre-determined period of time when extending loans to its customers
Statement II: Even though credit loss levels will fluctuate from year to year, there is an anticipated average level of losses over time that can be statistically determined
Statement III: Expected loss must be treated as a foreseeable cost of doing business in the lending business
Statement IV: Expected loss represents the level of losses predicted for the following year based on the economic cycle

Which of these statements are true?

A. I & II only

B. I, II & III only

C. II, III & IV only

D. I, II & IV only

Q.1052 Economic losses are determined using certain components. Which of the following is not a component that determines economic losses?

A. Probability of default.

B. Exposure amount.

C. Loss rate.

D. All of the three components determine Economic loss.

Q.1053 American International Bank sanctioned a loan to a corporate client. The following particulars are given in the credit note by the credit analyst of the client:
Exposure amount = 100 USD million
Loss rate = 10%
Probability of default = 20%

What is the expected loss of the loan?

A. USD 2 million.

B. USD 20 million.

C. USD 10 million.

D. USD 40 million.

Q.1054 Rojan Ortiz, a senior credit risk analyst at Asiana Bank, discusses with his colleague the components of the economic losses. He makes the following statements with regard to the components of the economic losses. Which of the following are true?
Statement I: The loss rate is the fraction of the exposure amount that is lost in the event of default
Statement II: Probability of default is a borrower-specific estimate that is typically linked to the borrower's risk rating
Statement III: Exposure amount and loss rate reflect and model the product specifics of a borrower's liability
Statement IV: Probability of default (PD) is a measure of the likelihood that a counterparty goes into default over a predetermined period of time

A. I & II only.

B. I, II & III only.

C. II, III & IV only.

D. All of the above.

Q.1055 A bank credit risk is preparing a manual on unexpected losses. Which of the following statements can be captured in the manual with regard to unexpected loss?
I. It is important to price unexpected losses in a loan's interest rate adequately
II. Unexpected loss in statistical terms is the standard deviation of credit losses, that is, the standard deviation of actual credit losses around the expected loss average
III. Unexpected loss can be calculated at the transaction and portfolio level
IV. Unexpected loss is the primary driver of the amount of economic capital required for credit risk

A. I & II only.

B. I, II & III only.

C. II, III & IV only.

D. All of the above.

Q.1056 John Sutton, a newly recent finance graduate working at Asana Finance Ltd., approaches his superior, George Shelton, to understand the differences and similarities between expected losses and unexpected losses?. Gorge makes the following statements:
Statement I: The unexpected loss of a specific loan on a stand-alone basis (i.e., ignoring diversification effects) can be derived from the components of expected loss
Statement II: Expected loss is calculated as the mean of a distribution whereas unexpected loss is calculated as the standard deviation of the same distribution
Statement III: Like expected losses, unexpected losses can also be calculated for various time periods and for rolling time windows across time
Statement IV: Unexpected losses stem from the (unexpected) occurrence of defaults and (unexpected) credit migration whereas expected losses must be treated as the foreseeable cost of doing business in lending markets

Which of these statements are true?

A. Statements I & II only.

B. Statements I, II & III only.

C. Statements II, III & IV only.

D. All of the above.

Q.1057 Which of the following represents the correct relationship between the expected loss, unexpected loss, and the actual loss?

A. Expected Loss = Unexpected Loss - Actual Loss.

B. Unexpected Loss = Expected Loss - Actual Loss.

C. Actual Loss = Expected Loss + Unexpected Loss.

D. Actual Loss = Expected Loss * Unexpected Loss.

Q.1058 ABX Bank Limited is holding a portfolio of loans. Which of the following, considering a loan at the portfolio level, is NOT part of the contribution of the single unexpected loss to the overall portfolio risk?

A. The loan's expected loss.

B. The loan's exposure amount.

C. The correlation of the exposure to the rest of the portfolio.

D. None of the above.

Q.1059 Neeson, a quantitative analyst, is preparing a model for estimating unexpected losses. He is incorporating appropriate distributions for the components of unexpected losses.
Which of the following are true with regard to the distributions of components of unexpected losses?
I. The probability of default is a binomial distribution
II. The loss rate can take a number of shapes, which results in different equations for the variances of loss rate
III. The binomial distribution understates the variance of the loss rate as compared to the uniform distribution
IV. The uniform distribution assumes that all defaulted borrowers would have the same probability of losing anywhere between 0 percent and 100 percent

A. I & II only

B. I, II & III only

C. II, III & IV only

D. I, II & IV only

Q.1061 Default correlations play an important role in measuring the marginal contributions of a loan to a loan portfolio. With regard to default correlations for a loan portfolio containing a large number of loans:

A. Default correlations are very difficult, if not impossible, to observe.

B. If the loan portfolio contains 'n' loans, [n(n-1)]/2 pairwise default correlations need to be estimated.

C. Default correlations are small, but positive providing considerable benefits to diversification in credit portfolios.

D. All of the above are true.

Q.1062 Anston Walsh, a credit analyst at Grant Bank, is entrusted with the task of calculating the economic capital for a portfolio of loans underwritten by the bank. Walsh based his task of computing economic capital on the following assumptions/statements. Which of them are to be considered in the computation to determine the most appropriate amount of economic capital?
Statement I: The amount of economic capital needed is the distance between the expected outcome and the unexpected (negative) outcome at a certain confidence level
Statement II: The crucial task in estimating economic capital is the choice of the probability distribution
Statement III: Credit risks are normally distributed
Statement IV: One distribution often recommended for measuring credit risk is the normal distribution

A. I & II only.

B. I, II & III only.

C. I, III & IV only.

D. All of the above.

Q.3074 BYJ commercial bank has $100 million of retail exposures. The 1-year probability of default averages 2% and the recovery rate averages 60%. If the correlation parameter is estimated at 0.1, what will be the 1-year unexpected loss at 99.9% confidence?

A. $7.68 million

B. $8.01 million

C. $4.32 million

D. $12.8 million

Q.3440 An investor holds a portfolio of $200 million. This portfolio consists of AA-rated bonds ($120 million) and BB-rated bonds ($80 million). Assume that the one-year probabilities of default for AA-rated and BB-rated bonds are 4% and 6%, respectively, and that they are independent. In the event of default, the recovery rate for AA-rated bonds is 65%, and the recovery rate for BB-rated bonds is 40%. Determine the one-year expected credit loss from this portfolio:

A. $1,680,000

B. $4,560,000

C. $4,500,000

D. $2,880,000

Q.3441 A portfolio consists of two bonds. The credit VaR – as defined by the bondholder – is the maximum loss due to defaults at a confidence level of 99%, over a period of one year. The probability that the two bonds jointly default is 2%, with a default correlation of 25%. The bond value, default probability, and recovery rate are USD 500,000, 5%, and 50% for one bond, and USD 300,000, 3%, and 30% for the other. Determine the expected credit loss of the portfolio:

A. USD 18,800

B. USD 12,500

C. USD 18,424

D. USD 12,424

Q.3657 Australian Synergies Finance Limited uses beta distributions to measure credit risks. The company states that the beta distribution helps in predicting the credit losses accurately. With regard to the measurement of credit losses, which of the following statements are true?
I. The beta distribution is often recommended and is a suitable probability distribution for measuring the credit losses
II. The beta distribution is especially useful in modeling a random variable that varies between -1 and +1
III. The shape of the beta distribution can be completely determined by specifying the parameters α and β
IV. The beta distribution is fully characterized by two parameters: expected loss of the portfolio and unexpected loss of the portfolio

A. I & II only

B. I, III & IV only

C. I, II & IV only

D. II, III & IV only

Q.3662 Nicolson Finance has taken credit exposure to two corporate clients. The credit risk characteristics of these two loans have been provided below:
Loan to customer 1: The sanctioned amount is USD 600 million, the exposure amount is USD 540 million, the probability of default over the next year is 2%, and the loss rate is 20% if the customer defaults. Moreover, the standard deviations of the probability of default and the loss rate are 3% and 35%, respectively.
Loan to customer 2: The sanctioned amount is USD 300 million, the exposure amount is USD 200 million, the probability of default over the next year is 1%, and the loss rate is 40% if the customer defaults. The standard deviations of the probability of default and the loss rate are 2% and 20%, respectively.
The correlation between the two loan accounts is 0.5.

What is the risk contribution of customer 1 and customer 2 to the loan portfolio?

A. Customer 1: 26.705 million and Customer 2: 2.611 million

B. Customer 1: 27.705 million and Customer 2: 1.611 million

C. Customer 1: 28.619 million and Customer 2: 2.611 million

D. Customer 1: 28.619 million and Customer 2: 1.611 million

Q.4644 A bank has two assets outstanding, denominated in U.S. dollars. The correlation between the two assets is 0.4. Other details are as follows:

	Asset A	Asset B
EA	1,600,000	2,000,000
PD	1%	2%
LR	30%	40%

Calculate the expected loss (EL) of the portfolio.

A. 22400

B. 20800

C. 18200

D. 20200

Q.4645 The amount of a loan issued by a bank is $2 million, with a default probability of 0.1% over a period of one year. If the recovery rate is estimated to be 40%, what it the expected credit loss?

A. $800

B. $1,000

C. $1,200

D. $700

Q.4646 The amount of a loan issued by a bank is $2 million, with a default probability of 0.1% over one year. If the recovery rate is estimated to be 40%, what is the standard deviation expected credit loss?

A. $37,928.35

B. $30,567.65

C. $32, 464.54

D. $35,890.75

Q.4647 The Bank of Africa has a portfolio of three $2 million loans, each with a default rate of 0.5% over one year. If the correlation between the loans is 0.4 and the recovery rate is 40%, what is the mean of the portfolio credit loss?

A. $18,000

B. $12,000

C. $10,000

D. $9,000

Q.4648 The Bank of Africa has a portfolio of three $2 million loans, each with a default rate of 0.5% over one year. If the correlation between the loans is 0.4, and the recovery rate is 40%, what is the standard deviation of the portfolio credit loss?

A. $426,875

B. $38,685

C. $84,600

D. $196,593

Q.4650 Aiden Bank has a $500 million loan portfolio with a PD of 0.5%. Assuming the Vasicek Model, what is the 99.9 percentile of the default rate if the correlation parameter is 0.25?

A. 0.1305

B. 0.0165

C. 0.1169

D. 0.0175

Q.4652 A bank has a loan portfolio consisting of three loans A, B, and C with standard deviations of 1.25 each. The correlations matrix appears as follows:

	Loan A	Loan B	Loan C
Loan A	1	0	0.3
Loan B	0	1	0.6
Loan C	0.3	0.6	1

Suppose the size of loan A is increased by 1%. Using the Euler's theorem, calculate the contribution of loan A to the total standard deviation.

A. 0.76

B. 0.72

C. 0.80

D. 0.74

Q.4653 Credit risk capital for derivatives is challenging to calculate as compared to that of the loans. Which of the following reason(s) makes this statement true?

A. The exposure at default for the derivative is relatively less certain than it is for the loans.

B. Derivatives are subject to netting agreements.

C. All of the above.

D. None of the above.

Q.4654 Barclays Bank has a $600 million loan portfolio, and the recovery rate in the event of default is 40%. Assuming the Vasicek Model, the required regulatory capital is $5 million. The 99.9 percentile for default rate is 0.0188. What is the probability of default for the loan portfolio?

A. 0.0051

B. 0.0400

C. 0.0049

D. 0.0054

Q.4655 A bank issues a $2 million loan, with a default probability of 0.5% over one year. The standard deviation of the expected credit loss is $35,000. What is the recovery rate?

A. 0.752

B. 0.456

C. 0.656

D. 0.764

Q.4656 A bank issues a $7 million loan, with a default probability of 0.5% over a period of one year. If the recovery rate is estimated to be 35%, what is the expected credit loss on this loan?

A. $23,350

B. $22,750

C. $23,600

D. $22,850

Q.4657 An American bank recently issued a USD 5 million loan to a business entity, of which USD 2 million is currently outstanding. According to the bank's internal rating model, the business entity has a 0.5% chance of defaulting over the next year. In case that happens, the estimated loss rate is 25%. The probability of default and the loss rate have standard deviations of 7% and 17%, respectively. What is the value of unexpected loss?

A. $41,245.45

B. $42,461.75

C. $40,564.56

D. $45,563.45

Q.4658 The bank of Aides has a portfolio consisting of 100,000 loans, each amounting to $1 million, and has a 1% probability of default in a year. The recovery rate is 40%, and the correlation coefficient is 0.3. Calculate α, the standard deviation of the loss from the loan portfolio as a percentage of its size.

A. 0.033

B. 0.045

C. 0.056

D. 0.045

Reading 51: Operational Risk

Q.1069 US International Bank is contemplating assessing operational risk for regulatory capital. Which of the following approaches can be used to calculate operational risk?
I. Basic indicator approach
II. Standardized approach
III. Advanced measurement approach
IV. Internal Ratings Based approach

A. I, II & III only.

B. I, III & IV only.

C. II, III & IV only.

D. All of the above.

Q.1070 A bank follows the basic indicator approach for assessing operational risk for regulatory purposes. Which of the following statement(s) is/are NOT true with regard to the basic indicator approach?

A. Under this approach, operational risk capital was set equal to 15% of the three-year average annual gross income.

B. Gross income is defined as net interest income.

C. Net interest income is the excess of income earned on loans over interest paid on deposits and other instruments that are used to fund the loans.

D. All of the above are true.

Q.1071 Eurasia Bank Limited is following the basic indicator approach for calculating the operational risk amount for the year 2016. The financial details of the bank are given below:

	Income earned (In million USD)	Interest paid	Non-interest income
Year 2015	105	52	18
Year 2014	100	50	20
Year 2013	95	40	16

Based on the original Basel Accord, the bank must hold capital for operational risk for 2016 equal to:

A. USD 10.60 million.

B. USD 10.95 million.

C. USD 11.05 million.

D. USD 7.90 million.

Q.1072 American International Bank is using the standardized approach for measuring operational risk for regulatory capital. The bank is least likely to:
I. Have an operational risk management function that is responsible for identifying, assessing, monitoring, and controlling operational risk
II. Keep track of relevant losses by business line and must create incentives for the improvement of operational risk
III. Have a well-documented operational risk management system
IV. Estimate unexpected losses based on an analysis of relevant internal and external data, and scenario analyses

A. I & II only.

B. III & IV only.

C. III only.

D. IV only.

Q.1073 The Basel Committee on Banking Supervision (BCBS) has identified seven categories of operational risk. Which of the following categories are covered by the Basel Committee?
I. Employment practices and workplace safety
II. Clients, products, and business practices
III. Execution, delivery, and process management
IV. Strategic risk

A. I, II & III only.

B. II, III & IV only.

C. I, II & IV only.

D. All of the above.

Q.1074 A bank with annual revenues of $4 billion has incurred a loss of $200 million on account of operational risk. What would be the losses for a bank with a similar business profile but with revenues of $12 billion? Assume the exponent for scaling losses is 0.23.

A. USD 7.76 million

B. USD 12.76 million

C. USD 257.5 million

D. USD 200.00 million

Q.1075 Your Canadian Bank has been using the standardized approach for the last three years. The board of directors has recently decided to use the advanced measurement approach for measuring operational risk for regulatory risk from the current year onwards. Considering the change in measurement approach, which of the following process has been adopted from the current year onwards in the risk management department of the bank?

A. Regular reporting of operational risk losses throughout the bank.

B. Well-documented operational risk management system.

C. Regular independent review of operational risk management processes by internal auditors, external auditors, and supervisors.

D. Estimation of unexpected losses based on an analysis of relevant internal and external data, and scenario analyses.

Q.1076 Bank X is following the advanced measurement approach for measuring operational risk. Which of the following should be the operational risk capital computed for regulatory purposes?

A. The bank must use 15% of net interest income over the previous three years.

B. The bank's activities are divided into eight business lines. The average gross income over the last three years for each business line is multiplied by a "beta factor" for that business line, and the result is summed to determine the total capital.

C. The bank must estimate one-year 99.9% VaRs for the seven categories of operational risks identified by the Basel Committee and then aggregate them to determine a single one-year 99.9% operational risk VaR measure.

D. The bank must use 15% of net interest income plus non-interest income over the previous three years.

Q.1077 Loss severity and loss frequency are two distributions that are important in estimating potential operational risk losses for a risk type. With regard to these two distributions, which of the following is true?

A. For loss frequency, the natural probability distribution to use is a Poisson distribution, and for the loss-severity probability distribution, a lognormal distribution is used.

B. For loss frequency, the natural probability distribution to use is a lognormal distribution, and for the loss-severity probability distribution, a Poisson distribution is used.

C. For loss frequency, the natural probability distribution to use is a Poisson distribution, and for the loss-severity probability distribution, a normal distribution is used.

D. For loss frequency, the natural probability distribution to use is a normal distribution, and for the loss-severity probability distribution, a Poisson distribution is used.

Q.1078 The Basel Committee on Banking Supervision (BCBS) requires the implementation of the advanced measurement approach to involve some elements. These include:
I. Internal data
II. External data
III. Strategic analysis
IV. Business environment and internal control factors

A. I, II & III only.

B. II, III & IV only.

C. I, II & IV only.

D. All of the above.

Q.1080 New Zealand National Bank uses the advanced measurement approach to compute the operational risk capital for regulatory purposes. Noria Franti, a financial controller working at the bank, analyzes the research reports on internal data and external data. She concludes the following from the analysis:
I. Banks have done a much better job at documenting their operational losses than their credit risk losses.
II. Credit card frauds are high-frequency, low-severity losses.
III. When an institution can not use its own data, then external data can be used for the loss severity distribution.
IV. The loss frequency distribution must be specific to the bank and based on internal data and scenario analysis estimates.

Which of these statements are correct?

A. I & III only.

B. III & IV only.

C. I, II & IV only.

D. II, III & IV only.

Q.1082 The operational risk team of the Canadian Insurance Group informs the risk committee that the company faces higher risk than predicted while insuring a bank against operational losses because the bank operates recklessly after taking the insurance cover, further increasing the risks it is exposed to. Which of the following clauses/precautions can be taken to mitigate this risk?
I. Deductible in the insurance policy
II. Coinsurance provision
III. Policy limit
IV. Understanding the controls existing within the bank and the losses that have been experienced

A. I & II only.

B. II & III only.

C. I, II & III only.

D. IV only

Q.1083 Frank Andrews, an operational risk analyst, is interested in using the power law to assess operational risk. Which of the following statement(s) is/are true with regard to the power-law?
I. The power law holds well for large losses experienced by banks
II. Loss data and scenario analysis are employed to estimate the power-law parameters using the maximum likelihood approach
III. When loss distributions are aggregated, the distribution with the heaviest tails tends to dominate
IV. The loss with the highest alpha defines the extreme tails of the total loss distribution

A. I & II only.

B. II & III and IV only.

C. I, II & III only.

D. All of the above.

Q.1085 The existence of an insurance contract causes the bank to behave differently than it otherwise would and increases the risks to the insurance company. This risk is known as:

A. Adverse selection.

B. Moral hazard.

C. Wrong-way risk.

D. Operational risk.

Q.3442 Which of the following statements about the operational risk framework for banks is *most likely* incorrect?

A. Under the basic indicator approach, banks must set aside capital equivalent to 15% of the three-year average annual gross income

B. Under the standardized approach, a bank has to declare its gross income in eight business lines and then use beta factors to work out the amount of capital required in each line.

C. Banks using the advanced measurement approach must calculate the operational risk capital charge at a 99 percentile confidence interval and a one-year horizon.

D. According to the Basel committee, operational risk includes legal risk but explicitly excludes reputational and strategic risks.

Q.3443 Under the AMA method, insurance can be used to offset up to 20% of the operational risk charge. Which of the following statements about hedging operational risk are valid?

I. All insurance policies suffer from the problem of moral hazard, but deductibles and coinsurance provisions help to combat this problem
II. Adverse selection can result in a claim experience that's worse than initially anticipated
III. A primary disadvantage of insurance as a tool for operational risk management is the limitation of policy coverage
IV. The scorecard capital allocation method allocates capital to business lines in a firm as guided by the results of a risk survey conducted across the firm
V. If an operational risk hedge works properly, a firm will avoid damage to its reputation from a high-severity operational risk event

A. All of the above

B. III, and V

C. II, III, and V

D. I, II, III, and IV

Q.3444 A risk manager has established that there's a 90% probability that losses over the next year will not exceed $30 million. Given that the power law parameter is 0.8, what is the probability of the loss exceeding $10 million?

A. 22%

B. 24%

C. 20%

D. 23%

Q.4596 One of the major operational risks is compliance risk. Which of the following is/are example(s) of compliance risks?

A. Money laundering

B. Terrorism financing

C. Failure to comply with sanctions

D. All of the above

Q.4597 One of the operational risks is rogue trader risk. To protect itself from rogue trader risk, a bank should make the front office and back office independent of each other. Which one of the following statements distinguishes between the back and front office?

A. Trading takes place in the front office while record keeping is done in the back office

B. Record keeping is done in the front office, and trading is done in the back office

C. The front office is where management works, and the back office is where traders trade

D. None of the above

Q.4598 The average loss frequency of Bank of Africa is estimated to be once every 18 months. What is the probability of three losses in a year for this bank?

A. 0.0234

B. 0.057

C. 0.0254

D. 0.0507

Q.4599 Given the mean and the standard deviation of lognormal loss of a ban is 200 and 50 respectively, what is the variance of the logarithm of the loss?

A. 0.0606

B. 0.527

C. 0.069

D. 0.0629

Q.4600 Given the mean and the standard deviation of the lognormal loss of a bank is 200 and 50, what is the standard deviation of the logarithm of the loss?

A. 0.2462

B. 1.0308

C. 0.0606

D. 0.4724

Q.4601 Over the past ten years, the Bank of Yemen has had losses (in million euros) of 3, 6, 10, 50, 72, 101, and 200. What is the approximate amount of loss component of the bank under the SMA approach?

A. €656 million

B. €678 million

C. €756 million

D. €442 million

Q.4602 A manager for the stock trading department suspects that one of his staff has gone rogue. Which of the following key indicators would the manager use to identify the rogue trader?

A. The trader fails to take long holidays.

B. The trader would seek for long holidays.

C. The trader would always report trading transactions to the relevant authorities.

D. The trader would seek guidance from the relevant bodies before taking a position in stock trading.

Q.4603 The estimation of loss distribution is laden with several data issues. Which of the following is **NOT** among them?

A. Inadequate historical records.

B. The constant purchasing power of money.

C. Firm-specific adjustments.

D. None - all of the above are valid data issues.

Q.4604 The 90-percentile of a loss distribution is 30. Using the power law with $\alpha = 4$, what is the value of 95-percentile of the loss distribution?

A. 35.68

B. 30.45

C. 25.56

D. 27.89

Q.4606 Bank A has revenues of USD 50 billion and incurs a loss of USD 300 million. Another bank B has revenues of USD 40 billion. Given that the estimated loss for bank A is 250 million, which of the following is closest to the observed loss for Bank (Assume the scale adjustment is 0.23) B?

A. USD 263.2 million

B. USD 200 million

C. USD 312.5 million

D. USD 237.5 million

Q.4607 Over the last three years, an American bank earned an interest of USD 300 million and paid interest of USD 150 million on average. The bank's noninterest income over the last three years is USD 600 million on average. Under the indicator method, what is the value of the operational risk capital?

A. $75 million

B. $250.40 million

C. $112.50 million

D. $140.50 million

Reading 52: Stress Testing

Q.1086 AIZ bank, a newly set up bank, proposes to use stress testing to measure risk. Which of the following statements are true with regard to stress testing as a risk management tool in banking?
I. Stress testing is an important risk management tool that banks use as part of their internal risk management and, through the Basel II capital adequacy framework, is promoted by supervisors
II. Stress testing alerts bank management to unexpected adverse outcomes related to a variety of risks and provides an indication of how much capital might be needed to absorb losses should large shocks occur
III. While stress tests provide an indication of the appropriate level of capital necessary to endure deteriorating economic conditions, a bank alternatively may employ other actions in order to help mitigate increasing levels of risk
IV. Stress testing is especially important after long periods of benign economic and financial conditions when fading memory of negative conditions can lead to complacency and the underpricing of risk

A. I & IV only.

B. II & IV only.

C. I, II & IV only.

D. All of the above.

Q.1087 The financial crisis of 2007-2009 has revealed several weaknesses in organizational aspects of stress testing programs. Which of the following are some of these weaknesses?
I. Stress testing at some banks was performed mainly at the firm-wide level
II. At some banks, the stress testing program was a mechanical exercise
III. While stress testing for market and credit risk had been practiced for several years, stress testing for interest rate risk in banks has emerged more recently
IV. Stress testing frameworks were usually not flexible enough to respond quickly as the crisis evolved

A. I & IV only.

B. II & IV only.

C. I, II & IV only.

D. All of the above.

Q.1088 With regard to stress testing methodologies, which of the following statement(s) is/are true?
I. Stress tests may be performed at varying degrees of aggregation, from the level of an individual instrument up to the institutional level
II. Stress tests are performed for different risk types including market, credit, operational, and liquidity risk
III. At the most fundamental level, weaknesses in infrastructure limit the ability of banks to identify and aggregate exposures across the bank
IV. Unlike most risk management models, stress tests do not use historical statistical relationships to assess risk

A. II, III & IV only.

B. I, II & IV only.

C. I, II & III only.

D. All of the above.

Q.1089 Scenario selection is very important in measuring the risks of the banks using stress tests. With regard to scenario selection and stress tests prior to the crisis, which of the following statements are true?
I. Scenarios tended to reflect mild shocks, assume shorter durations and underestimate the correlations between different positions, risk types and markets due to system-wide interactions and feedback effects
II. Sensitivity tests, which are at the most basic level, generally shock individual parameters or inputs without relating those shocks to an underlying event or real-world outcome
III. Banks also implemented hypothetical stress tests, aiming to capture events that had not yet been experienced
IV. Scenarios that were considered extreme or innovative were often regarded as implausible by the board and senior management

A. II, III & IV only.

B. I, II & IV only.

C. I, II & III only.

D. All of the above.

Q.1091 The senior management of the African Industrial Development Bank is reviewing the stress program post a severe financial crisis in Africa. With regard to the stress testing program, which of the following is most accurate?

A. Senior management is ultimately responsible for the overall stress testing program, whereas the risk department is accountable for the program's implementation, management, and oversight.

B. The Chief Risk Officer is ultimately responsible for the overall stress testing program, whereas the risk department is accountable for the program's implementation, management, and oversight.

C. The risk committee is ultimately responsible for the overall stress testing program, whereas the risk department is accountable for the program's implementation, management, and oversight.

D. The board of directors is ultimately responsible for the overall stress testing program, whereas the senior management is accountable for the program's implementation, management, and oversight.

Q.1092 The senior management of the African Industrial Development Bank is reviewing the stress program post a severe financial crisis in Africa. With regard to the stress testing program, which of the following statements are accurate?
I. The stress testing program should cover pipeline and warehousing risks. A bank should include such exposures in its stress tests regardless of the probability of being securitized.
II. A bank should enhance its stress testing methodologies to capture the effect of reputational risk. The bank should integrate risks arising from off-balance-sheet vehicles and other related entities in its stress testing program.
III. A bank should enhance its stress testing approaches for highly leveraged counterparties considering its vulnerability to specific asset categories or market movements and in assessing potential wrong-way risk related to risk-mitigating techniques.
IV. The stress testing program should explicitly cover complex and bespoke products such as securitized exposures. Stress tests for securitized assets should consider the underlying assets, their exposure to systematic market factors, relevant contractual arrangements and embedded triggers, and the impact of leverage, particularly as it relates to the subordination level of the issue structure.

A. II, III & IV only.

B. I, II & IV only.

C. I, II & III only.

D. All of the above.

Q.1151 A bank has recently launched a fund for retail investors. The risk management team carries out stress testing of the newly launched fund to determine the impact of the fund on the bank's overall capital. Jason Bloomberg, a newly recruited risk manager, observes that the bank has an independent risk management team. He notes that the entire risk assessment and identification process is carried exclusively through stress testing. While examining the stress testing result, John observes that the test produces multiple potential losses under various scenarios. Bloomberg also observes that the inputs from the bank's top economists were taken while modeling the stress testing scenarios. He finds that the stress testing procedures are well documented and no deviation is allowed from the procedure.
The bank's stress testing results produce multiple potential losses. In view of this, select the most appropriate option.

A. The stress testing result must be actionable.

B. The stress testing results must be integrated into decision-making, but only at the senior-most level of management.

C. The stress testing result must accurately specify the exact amount of loss associated with a given variable.

D. Stress testing produces potential losses and hence no action is required on the results.

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Inputs from the bank's top economist were considered while developing the scenario for stress testing. In view of this, select the most appropriate statement.

A. Inputs from economists make the model more robust.

B. Inputs from all stakeholders such as economists, business managers, fund managers, etc. must be taken into account.

C. Only inputs from the risk management team in collaboration with the fund manager must be taken into account.

D. The risk management team must independently design the models.

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Select the most appropriate statement.

A. The stress testing procedure must be well documented.

B. The stress testing procedure must be well documented and no deviation must be allowed.

C. The stress testing procedure must be well documented and it must also allow the bank to perform flexible and ad-hoc stress tests.

D. The stress testing procedure should not be documented; only the results should be shown to the managers.

Q.1154 A bank has recently launched a fund for retail investors. The risk management team carries out stress testing of the newly launched fund to determine the impact of the fund on the bank's overall capital. Jason Bloomberg, a newly recruited risk manager, observes that the bank has an independent risk management team. He notes that the entire risk assessment and identification process is carried exclusively through stress testing. While examining the stress testing result, John observes that the test produces multiple potential losses under various scenarios. Bloomberg also observes that the inputs from the bank's top economists were taken while modeling the stress testing scenarios. He finds that the stress testing procedures are well documented and no deviation is allowed from the procedure.
Select the most appropriate statement.

A. Stress testing results must be confidential.

B. Stress testing result must be used only internally.

C. Stress testing results may be disclosed to outsiders with sufficient supporting information.

D. Stress testing must be disclosed only to supervisors.

Q.1155 XYZ Bank has multiple branches across the country. The bank has 10 verticals for each of its products headed by 10 Vice Presidents. The VPs report directly to the Chairman of the bank. The bank also has an independent risk management team that reports directly to the Chairman. Each vertical carries out its individual stress tests and submits the reports to the vertical head which then presents them to the Chairman. The stress test procedure indicates three scenarios which must be stress tested in each of the verticals, and all the VPs ensure that the procedure is fully complied with.

The current capital position of the bank indicates no material threat to the viability of the bank. In view of this, the bank's risk management team does not include scenarios that challenge the viability of the bank in the stress tests. The risk management team also suggests independent stress testing of market assets and the funding liquidity. The bank, in its investor presentation, proudly claims to stress test each component of the balance sheet.

Each vertical of the bank carries out stress tests independently. In view of this, select the most appropriate statement.

A. Individual stress testing is desirable.

B. Individual stress testing overestimates the risk.

C. Risk arising due to linkages between the verticals must also be included in the stress testing.

D. Individual stress testing makes the stress testing process straightforward.

Q.1156 XYZ Bank has multiple branches across the country. The bank has 10 verticals for each of its products headed by 10 Vice Presidents. The VPs report directly to the Chairman of the bank. The bank also has an independent risk management team that reports directly to the Chairman. Each vertical carries out its individual stress tests and submits the reports to the vertical head which then presents them to the Chairman. The stress test procedure indicates three scenarios that must be stress tested in each of the verticals, and all the VPs ensure that the procedure is fully complied with.

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Select the most appropriate statement.

A. Three scenarios, as indicated in the stress test procedure, is sufficient to assess the risk.

B. Stress testing must include multiple scenarios.

C. The stress testing procedure must be flexible and must include forward-looking scenarios.

D. A minimum of 10 scenarios must be used to perform stress testing.

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Select the most appropriate statement.

A. In the case of bank XYZ, the risk management team is correct not to include scenarios which challenge the viability of the bank.

B. In the case of bank XYZ, the risk management team must include scenarios with increased severity but must not challenge the viability of the bank.

C. In the case of bank XYZ, the stress test must not include scenarios which challenge the viability of the bank.

D. In the case of bank XYZ, the stress test must include scenarios which challenge the viability of the bank.

Q.1159 Select the most appropriate statements.

I. A bank must stress test each component of the balance sheet
II. A bank must stress test off-balance sheet items
III. A bank must only stress test liquid, market-related items, either on or off the balance sheet
IV. The stress test must include only contractual off-balance sheet items

A. I & II only.

B. I, II & III.

C. I, III & IV.

D. All of the above.

Q.1160 Which of the following statements is/are accurate?

I. Supervisors should verify the active involvement of senior management in the stress testing program
II. Banks must submit firm-wide stress tests to supervisors at regular intervals
III. Under the Internal Capital Adequacy and Assessment Process (ICAAP), the bank will make use of internal models to assess, quantify and stress test risk drivers
IV. Stress testing results must not impact the strategic business decisions of the bank

A. II, III & IV

B. I, II & III

C. I & III

D. I & IV

Q.1161 Which of the following statements is/are correct?

I. A bank must not disclose the assumptions made during the stress testing to supervisors
II. Supervisors must not take into account capital freely transferable within banking groups in times of stress
III. Supervisors must only examine the need of capital for the bank
IV. Supervisors should review the range of remedial actions envisaged by a bank in response to the results of the stress testing program

A. I only

B. IV only

C. I & III

D. III & IV

Q.1162 Select the most appropriate statement.

A. Supervisors must not determine stress scenarios.

B. Supervisors must determine certain stress scenarios.

C. Stress scenarios must be designed exclusively by the bank.

D. Stress scenarios must not be disclosed.

Q.1163 Supervisors must examine a bank's stress testing results as prescribed in the Basel II framework under:

A. Pillar I.

B. Pillar II.

C. Pillar III.

D. None of the above.

Q.1165 All the following are true for stress testing, EXCEPT:

A. The goal of stress testing is to identify unusual scenarios which are not covered under standard VaR models.

B. Stress testing considers all scenarios covered under standard VaR models.

C. Stress testing is helpful in the analysis of events which generally get ignored.

D. Stress testing is helpful in the analysis of extreme events.

Q.1166 A bank funds its long-term loans by issuing short-term debt instruments such as commercial papers, NCDs with residual maturity of less than 1 year, deposits, etc. A risk manager wants to stress test the bank's balance sheet to examine its vulnerabilities. The stress test may include which of the following scenarios?

I. Availability of surplus liquidity
II. Failure to roll over short-term debt
III. Increase in short-term interest rates
IV. Increases in deposits

A. Only I

B. II & III

C. I & IV

D. III & IV

Q.1167 A fund manager examines the annual return generated by fund A for the last 10 years. The return generated by the fund is furnished in the table below:

Year	Return
2015	+9.45%
2014	−4.45%
2013	+5.34%
2012	−3.35%
2011	+2.45%
2010	−6.56%
2009	+7.41%
2008	−8.83%
2007	+2.33%
2006	+1.32%

The fund manager intends to stress test Fund A for various scenarios. Select the correct option with regards to the stress testing of Fund A.

A. As the maximum loss during the last 10 year is 8.83%, the stress test scenario for maximum loss must not exceed 8.83%.

B. As the average loss during the last 10 years is 5.80%, the stress test scenario for maximum loss must be equal to 5.80%.

C. The stress test scenario for maximum loss must be more than the historical maximum loss posted by the fund.

D. As the average return generated by the fund for the last 10 years is 0.51%, the stress test scenario for maximum loss must be -0.51%.

Q.1168 A risk manager examines a portfolio (AUM- $100 million) and observes that the performance of the fund is dependent on two variables, α and β. The manager wants to carry out a stress test of the portfolio. He defines two scenarios to stress test the portfolio:

I. The value of α is pushed up by x and the value of β is pushed down by y
II. The value of α is pushed down by x and the value of β is pushed up by y

After performing the stress test, the risk manager suggests that a contingency fund of $10 million must be maintained. Select the most appropriate statement.

A. A contingency fund of $10 million must be maintained as suggested by the risk manager.

B. A contingency fund of more than $10 million must be maintained.

C. The correlation between the two variables must be considered while performing the stress test.

D. As stress tests generally involve events which rarely occurs, the contingency fund must not be maintained.

Q.1170 A fund manager intends to carry out scenario analysis of his portfolio. The portfolio consists of 25% government bonds, 60% global equities, and 15% investment in gold ETFs. The fund manager lists the portfolio's risk factors. He intends to perform a scenario analysis by generating scenarios based on the adverse movement in the portfolio's identified risk factors. Such an approach to scenario analysis is referred to as:

A. Event-driven scenario analysis.

B. Portfolio-driven scenario analysis.

C. Factor push method.

D. Historical method.

Q.1171 A financial institution should set out clearly stated and understandable policies and procedures governing stress testing, which must be adhered to. The policies and procedures ensure that the stress testing of parts of a financial institution converges to the same point. The policies and procedures should be able to:

A. Explain the purpose of stress testing.

B. State the frequency at which the stress testing can be done.

C. Describe the roles and responsibilities of the parties involved in stress testing.

D. All of the above.

Q.1172 The general belief that diversification leads to risk reduction was challenged during the Global Financial Crisis of 2007-2009. During the crisis, it was observed that the correlation between different assets increased due to which the concept of diversification failed.
Imagine yourself being a risk manager. In order to assess the likely impact of such events, the most appropriate tool is the:

A. Scenario analysis.

B. Sensitivity analysis.

C. Historical simulation.

D. Factor push analysis.

Q.1173 All the following are true for stress testing, EXCEPT:

A. It is highly subjective.

B. The events are reported without an attached probability making the result difficult to interpret.

C. It is not helpful in ensuring the survival of an institution in times of market turmoil.

D. Implausible scenarios may lead to irrelevant potential losses.

Q.1174 Which of the following is/are correct statements?

I. The worst case loss never exceeds that predicted by VaR measures
II. Stress testing is a replacement for traditional VaR measures
III. Stress testing may lead to a large number of information
IV. Stress testing allows risk managers to assess the blind spots

A. Only I

B. I & II

C. III & IV

D. I & IV

Q.2812 One of the key elements of sound governance over stress testing is the governance structure.

Which of the following statements regarding governance structure is incorrect?

A. The internal audit should provide an independent evaluation of the ongoing performance, integrity, and reliability of the stress-testing activities.

B. The board of directors should execute the overall stress testing strategy (including establishing adequate policies and procedures, assigning competent staff, etc.).

C. An institution should have clear and comprehensive stress testing policies, procedures and documentation.

D. Stress-testing governance should incorporate validation or another type of independent review to ensure the integrity of stress-testing processes and results.

Q.2813 What is the advantage of reverse stress testing?

A. By concentrating on different scenarios, reverse stress testing helps to identify the most profitable business lines.

B. Reverse stress testing does not consider scenarios beyond its normal business expectations and concentrates on issues that could affect business during the normal business operations.

C. Reverse stress testing does not consider scenarios beyond its normal business expectations and consequently does not require a comprehensive analysis.

D. By evaluating scenarios and circumstances that would render a business unviable, reverse stress testing identifies potential business vulnerabilities.

Q.2814 During which phase of the economic cycle is stress testing most important?

A. During the beginning of an economic recession.

B. In the middle of an economic recession.

C. In the beginning of an economic expansion.

D. After a long period of economic expansion.

Q.3445 Which of the following parties bears the ultimate responsibility for stress testing programs in banks?

A. The risk management function

B. Senior management

C. The board of directors

D. Internal audit

Q.3446 Which of the following options *most accurately* presents a key governance issue that played a critical role in the failure of banks in the lead up to the 2007/2009 financial crisis?

A. Senior management played little or no role at all in the development and operation of stress testing.

B. Stress testing reports would be passed up to the boards of directors without first being approved by senior management

C. Stress testing did not appear to be sufficiently integrated into institutions' risk management frameworks, nor were test results taken into account during decision making

D. Stress testing programs lacked clear, well-detailed policies meant to outline the procedure to follow from the start to the end, as well as describing the role played by various employees

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Q.3447 According to the CRMPG II report and the Basel committee report produced in the aftermath of the 2007/2009 financial crisis, rigorous stress testing should be a goal of all firms. To make stress testing more productive, firms should consider all of the following *except*:

A. Identifying a wide range of scenarios that could result in portfolio losses

B. Simulating the effects of capital problems and illiquidity pressures happening at the same time

C. Asking risk managers to define and clearly express firm loss tolerance levels

D. Ensuring that the scenarios tested are in line with the direction and long-term strategy set by the board of directors

---

Q.3448 The following statements regarding stress testing and value at risk methods are incorrect, EXCEPT:

A. From a practical point of view, VaR measures commonly utilize just a few scenarios

B. Ordinal arrangements are a key feature of VaR methods

C. For regulatory stress tests, the current period is used as the departure point while generating hypothetical scenarios

D. While VaR methods reveal the causal risk(s), stress tests do not

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Q.3451 Prior to the recent crisis, stress testing was marked by several practices including:

I. Inadequate firm-wide perspective
II. Overreliance on sensitivity analysis
III. Limited recognition of interactive effects
IV. A lack of overall organizational view

A. II and III

B. I and IV

C. II only

D. All of the above

Q.3452 Following the 2007/2008 financial crisis, stress testing for securitized products should consider which of the following features?

I. Contingency funding needs of the issuer
II. Credit ratings of similar securities on the market
III. Quality of underlying asset pool
IV. Subordination level of tranches
V. Systematic market conditions

A. All of the above

B. III and IV

C. II and V

D. I, III, IV, and V

Q.3453 Which of the following statements related to stress testing and Basel II is correct?

I. Basel II requires banks to conduct stress tests and assess capital adequacy at least once every month
II. In line with Basel II, a bank should take into account both its capital and liquidity needs while conducting stress tests

A. I only

B. II only

C. Both I and II

D. Neither I nor II is correct

Q.3454 Which of the following statements is (are) true?
Prior to the 2007-2008 credit crisis:

I. Stress testing was mostly geared towards individual business lines without considering comprehensive firm-wide perspective
II. Stress testing was primarily focused on historical or hypothetical scenarios

A. I

B. II

C. Both I and II

D. Neither

Q.3455 Which of the following statements is (are) correct?
Stress testing methods consider inter-correlations between:

I. funding and market risks
II. basis and liquidity risks
III. market and pipeline risks
IV. reputational and liquidity risks

A. II only

B. I, II and IV

C. II and III

D. I, II, III and IV

Q.4557 Which of the following statements correctly distinguish between stress testing and expected shortfall?

I. Expected shortfall is backward-looking but stress testing is forward-looking
II. Stress testing is backward-looking but expected shortfall is forward-looking
III. Whereas stress testing is based on the future probability distribution, the expected shortfall is based on past probability distribution.
IV. Expected shortfall analysis often relatively takes a short time but stress testing takes relatively long periods

A. I and II

B. II and III

C. I and IV

D. IV only

Q.4558 Which of the following is/are **TRUE** about the stressed VaR and stressed Estimated shortfall (ES)?

I. The data used to calculate stressed Var and stressed ES are drawn from stressful periods, such as the year 2007
II. Stressed VaR and stressed ES are calculated based on a short period of time
III. Similar to traditional VaR, stressed VaR could be back-tested

A. I only

B. III only

C. I and II only

D. All of the above

Q.4559 Which of the following is **NOT** an internally developed stress test scenario?

A. Historical scenario

B. Baseline scenario

C. Ad hoc scenario

D. None of the above

Q.4560 A bank carries out regular stress testing to determine its appropriate capital level. During a given year, the bank generates a scenario to assume that the GDP growth rate might decline by 3%. Under the impending circumstances, which type of scenario will the bank *most likely* internally generate?

A. Ad hoc scenarios.

B. Historical scenarios.

C. Stressing key variables scenarios.

D. None of the above.

Q.4561 Which of the following correctly describes stressed VaR?

A. There is an X% likelihood that the losses will not exceed the VaR level during a given time T.

B. If the losses exceed the VaR level at a given time T, then the average loss is equivalent to the stressed VaR level.

C. If a stressed period is repeated, then there is X% likelihood that over a period of T days, the losses will not exceed the stressed VaR level.

D. If the losses over a period of T days exceed the stressed VaR level, then the expected loss is equivalent to the VaR level.

Q.4563 The variables stated in the context of scenario analysis are termed as:

A. Core variables

B. Key variables

C. Peripheral variables

D. Volatility variables

Q.4564 While analyzing the stress testing results, analysts should consider the impacts of the stress testing scenarios and also knock-on effects. What is a knock-on effect?

A. It is an effect due to the way a financial institution responds to an adverse condition.

B. It is an effect on the way financial institutions implement stress testing.

C. It is a negative influence from the staff conducting the stress test.

D. It is an effect that arises due to the involvement of the Board and senior management in the stress testing process.

Q.4565 In the context of the stress testing, which of the following is **INCORRECTLY** described?

I. The primary objective of reverse stress testing is to determine how a financial institution can fail
II. Stressed VaR gives a high percentile of the distribution of losses over a period of time conditional on the recurrence of a stressed period
III. Stressed VaR analyses the results of a selected scenario over a short period of time
IV. VaR tells us the minimum amount of loss that could be incurred over a period of T days based on past data.
V. Knock-on effects are the secondary effects of an adverse scenario

A. I, II and III

B. II only

C. IV only

D. IV and V

Q.4566 In the context of regulatory stress testing in the United States, which of the following is **true?**

A. Comprehensive Capital Analysis and Review (CCAR) is a stress test performed by the Federal Reserve on banks with consolidated assets of over USD 50 million.

B. Under the CCAR, banks are required to consider three scenarios: baseline, severe, and an internal scenario.

C. Under the Dodd-Frank Act Stress Test (DFAST), banks are required to submit a capital plan.

D. The Dodd-Frank Act Stress Test (DFAST) applies to banks with consolidated assets between USD 10 billion and USD 50 billion.

Q.4567 A financial institution should have written policies and procedures for stress testing. Which one of the following is **NOT** included in policies and procedures of stress testing?

A. Responsibilities and roles of the staff conducting the stress testing.

B. Procedure for defining selection of scenarios.

C. The description of the consumption of the stress testing results.

D. The description of the limitation of access to stress testing results by the management.

Q.4568 One of the key features of stress test governance is validation and independent review. Which one of the following is **NOT** a function of validation and independent review?

A. It continuously monitors the results of the stress testing.

B. Making sure that stress testing is based on the robust theory.

C. It addresses the qualitative aspects of the stress test.

D. It defines how stress testing should be carried out in a financial institution.

Q.4569 Validation and independent reviews is an essential aspect of stress testing governance. Which of the following is/are (a) feature(s) for sufficient validation and independent review?

I. The reviews should be unbiased
II. The external models from the vendors and the internal models should be subject to the different reviewers
III. The Board should ensure that the staff carrying out the stress test have relevant qualifications
IV. The Board should ensure that the stress testing documentation is of satisfactory level

A. I, II, III and IV

B. I only

C. IV only

D. I and IV

Q.4570 Before the 2007-2008 financial crisis, the stress tests were faced with numerous shortcomings. Which of the following is **NOT** a feature of the stress test before the financial crisis as observed by the Basel Committee?

A. The Board and senior management were not adequately involved in stress testing.

B. Stress testing was taken as a mere mechanical process and did not much impact on decision making.

C. The risk exposure was over-aggregated hence exaggerating the overall picture of the enterprise-wide view of risks.

D. The scenarios developed were too moderate and the duration involved was too short.

Q.4571 In the context of Basel Committee Stress Testing Principles, choose the **correct** statement(s).

I. The staff responsible for the stress testing principles should be knowledgeable on the objectives of the stress testing framework
II. Stress testing models, results, and frameworks should be subject to challenge and regular review
III. The models used in stress testing should be well justified and documented

A. I and II

B. I and III

C. II and III

D. I, II, and III

Reading 53: Pricing Conventions, Discounting, and Arbitrage

Q.997 Kristen Haynes, an analyst working at Jahmal Securities, is explaining the different terminologies of prices to a new employee. She makes the following statements about mid-market and full prices per 100 face amount of bonds. Which of these statements are accurate?
Statement I. The mid-market price is an average of the highest price (bid-price) that a buyer is willing to pay and the lowest price, (ask-price) that the seller is willing to accept.
Statement II: The full price is often referred to as the flat or quoted price of the bond

A. Statement I only

B. Statement II only

C. Statements I & II

D. None of the above

Q.998 Joshua Williamson, an associate working at Supreme Bonds, calculates the prices of US Treasury bonds using the law of one price. However, he observes differences between the market price of bonds and the prices predicted by the law of one price. Which of the following may be the reason(s) for the differences in price?
I. Transaction costs
II. Bid-ask spreads in the financing markets
III. It is only in theory that US Treasury bonds are commodities, i.e., fungible collections of cash flows

A. I & II only

B. II & III only

C. I & III only

D. All of the above

Q.999 With regard to STRIPS, which of the following statements are true?
I. STRIPS are created when a particular coupon bond is delivered to the Treasury in exchange for its coupon and principal components
II. When reconstituting a bond, any C-STRIPS maturing on a particular date may be applied toward the coupon payment of that bond on that date
III. STRIPS prices are essentially discount factors
IV. The Treasury not only creates STRIPS but retires them as well

A. I & II only

B. II & III only

C. I & III only

D. All of the above

Q.1000 A 50-day US T-bill has a quoted price of 1.60. What is the cash price of the bill?

A. 94.75

B. 97.43

C. 100.23

D. 99.78

Q.1001 With regard to full price and flat price, which of the following statements are true?
I. The flat price of the bond per 100 face amount is defined as the full price plus accrued interest
II. When trading bonds day-to-day, it is more intuitive to track the flat prices and negotiate transactions in those terms
III. Within a coupon period, the full price of a bond, which is just the present value of its cash flows, increases over time as the bond's payments draw near
IV. From an instant before the coupon payment date to an instant after it, the full price falls by the coupon payment

A. I, II & III only

B. II, III & IV only

C. I, II & IV only

D. All of the above

Q.1002 Day conventions play an important role in determining the accrued interest and value of financial instruments. With regard to day conventions, which of the following statements are true?
I. For most government bonds in the US, the actual/actual day-count convention is used to determine accrued interests
II. In money markets, the actual/360 day-count convention is used
III. In case of corporate bonds and for the fixed leg of interest rate swaps, the 30/360 convention is most commonly used
IV. In case of discount securities and for floating legs of interest rate swaps, the 30/360 convention is most commonly used

A. I, II & III only

B. II, III & IV only

C. I, II & IV only

D. All of the above

Q.1003 Ronam Ltd. invests in semi-annual US Treasury bonds with face values of USD 1,000 on 15 June 2017. A bond made a coupon payment of USD 40 on February 15, 2017. The next coupon is due on August 15, 2017. If the quoted price for the bond for delivery on June 15, 2017, is USD 1001-16, what is the bond's full price?

A. USD 1,026.52

B. USD 1,013.48

C. USD 1,028.02

D. USD 1,014.98

Q.1004 A $1,000 par value U.S. corporate bond pays a semiannual 10% coupon. Assume the last coupon was paid 100 days ago and there are 30 days in each month. The accrued interest is closest to:

A. $55

B. $28

C. $25

D. $30

Q.2774 A fixed-income trader summarizes in the table below the prices of Treasury Bonds with semiannual coupon payment. The data is as of 01/01/17.

	Maturity	Coupon~Rate	Price (per $100 face value)
Tranche 1	30/06/2017	3.5%	99 − 00
Tranche 2	31/12/2017	4%	100 − 16
Tranche 3	30/06/2018	5%	101 − 04

What are the discount factors for 0.5, 1 and 1.5 years?

A. d(0.5) = 0.9730; d(1) = 0.9662; d(1.5) = 0.9393

B. d(0.5) = 0.9551; d(1) = 0.9422; d(1.5) = 0.9102

C. d(0.5) = 0.9633; d(1) = 0.9523; d(1.5) = 0.9085

D. d(0.5) = 0.98990; d(1) = 0.9782; d(1.5) = 0.8787

Q.2775 Consider a 2-year Treasury Bond that is currently trading on the market at a price of 97.75. The bond has a coupon rate of 5%, which is paid out semiannually.

d(0.5)	0.9777
d(1)	0.9471
d(1.5)	?
d(2)	0.8845

Given the discount factor structure shown in the table above, d(1.5) is closest to:

A. 0.9385

B. 0.9228

C. 0.9205

D. 0.9107

Q.2776 A risk manager is concerned with the pricing of one of the bank's treasury bonds that pays 3% semiannual interest and matures in two years. The discount factors for different maturities are as per the following table:

	Discount factor
d(0.5)	0.9950
d(1.0)	0.9727
d(1.5)	0.9327
d(2)	0.9045

What is the price of the bond?

A. 93.577

B. 94.187

C. 95.847

D. 96.157

Q.2777 At the end of March 2017, a junior trader at an investment bank was requested to provide information on her portfolio. The portfolio is presented below:

	Maturity	Coupon Rate	Market Price (per100 Face Value)	Frequency
Bond 1	30/09/2017	2%	$99-08$	semiannual
Bond 2	31/03/2018	4%	$101-16$	semiannual
Bond 3	30/09/2018	5%	$105-16$	semiannual

To revalue the portfolio, the trader uses the following discount factors:

	Discount Factor
d(0.5)	0.9991
d(1)	0.9799
d(1.5)	0.9705

Which of the above bonds is/are trading rich?

A. Bond 1

B. Bond 1 and Bond 2

C. Bond 3

D. Bond 2 and Bond 3

Q.2778 Which of the below presented fixed income instruments typically trade rich?

A. Long-term P-STRIPS.

B. AAA-rated Corporate bonds.

C. Short-term C-STRIPS.

D. Mortgage-backed securities.

Q.2779 A trader prepares a presentation to the investment committee of a bank with a suggestion to invest $10,000,000 in U.S. Treasury 2 and 3/8s of December 31, 2019, tranche with semiannual coupon payment frequency. The trader wants to invest in this tranche, as the quoted market price is much lower than his estimate of a fair price. To prove the point, the trader includes a table below with market prices of C-STRIPs as of June 30, 2017 (valuation date).

	Maturity	Market Price (per 100 face value)
Tranche 1	31/12/2017	$99.753
Tranche 2	30/06/2018	$97.257
Tranche 3	31/12/2018	$95.012
Tranche 4	30/06/2019	$94.332
Tranche 5	31/12/2019	$93.805

What is closest to the price of the Treasury bond?

A. $99.507

B. $105.209

C. $106.235

D. $98.079

Q.3418 The following table presents the characteristics of three different bonds with semiannual coupons and different times to maturity:

Maturity	Coupon	Price
6 months	6.0%	$102-20$
12 months	12%	$104-08+$
18 months	7.5%	$98-24$

If the principal repayment for each bond is $100, which of the following is closest to the discount factor for 1.5 years?

A. 0.9964

B. 0.8823

C. 0.8865

D. 0.9920

Q.3419 As the chief investment manager of one of your corporate clients, you determine that the use of STRIPS (separate trading of registered interest and principal securities) issued by the U.S. Treasury would help match assets with liabilities at various points in the future. Which of the following statements regarding STRIPS is correct?

A. Shorter-term STRIPS tend to trade cheap while longer-term STRIPS tend to trade rich

B. Shorter-term STRIPS tend to trade rich while longer-term STRIPS tend to trade cheap

C. Shorter-term C-STRIPS tend to trade at a discount

D. Longer-term C-STRIPS tend to trade at a premium

Q.4578 Suppose that the cash price of a US Treasury bill is 90 per 100 of face value. If the bill has 60 days to maturity, what is the quoted price of the Treasury bill?

A. 60

B. 61

C. 54.75

D. 58.93

Q.4579 Company ABC wishes to invest in a 184-day Treasury bill from the US government. The bill is currently issued at the cash price of 98.50. What is the quoted price of the bill?

A. 2.86

B. 2.08

C. 2.93

D. 2.75

Q.4580 Suppose a bond with a par value of 1000 has coupon payments of 10% per annum and a yield to maturity of 5%. If the bond has 4 years to maturity, what is the price of the bond?

A. 841.51

B. 1,177.30

C. 1,259.57

D. 3,628.22

Q.4581 A 20-days US treasury bill has a quoted price of 1.50. What is the cash price?

A. 99.84

B. 99.92

C. 98.5

D. 99.98

Reading 54: Interest Rates

Q.1005 Grant Bank pays an interest of 8% with interest getting compounded quarterly. The effective annual rate is equal to:

A. 8%

B. 8.2%

C. 8.4%

D. 8.1%

Q.1006 Royal Bank extends a loan of $1000 to a customer for 2 years. The bank charges interest with half-yearly compounding frequency. If the spot rate for a 2-year loan is 10% per annum, then the amount that the customer needs to pay after 2 years is closest to:

A. $1,200

B. $1,216

C. $1,210

D. $1,222

Q.1007 The spot rate for 1 year and 2 years are 10% and 12% respectively. The forward rate for a loan to be given in 1 year for a term of 1 year is:

A. 11%

B. 13%

C. 14%

D. 12%

Q.1008 John Marauder observes that two zero-coupon bonds issued by ACC Limited are currently trading at prices given in the table below:

Residual maturity	Price	Face value
1 year	$91.74	$100
2 year	$82.64	$100

The 1-year and 2-year spot rates are:

A. 9% and 10% respectively.

B. 10% and 11% respectively.

C. 8% and 9% respectively.

D. 11% and 12% respectively.

Q.1009 John Marauder observes that two zero-coupon bonds issued by ACC Limited are currently trading at prices given in the table below:

Residual maturity	Price	Face value
1 year	$91.74	$100
2 year	$82.64	$100

ABC Traders Private Limited managers are planning to issue zero-coupon bonds with a maturity of 1 year next year. As per the present market conditions, the price of the zero-coupon bond will most likely be:

A. $85.09

B. $95.09

C. $80.09

D. $90.09

Q.1010 John Marauder observes that two zero-coupon bonds issued by ACC Limited are currently trading at prices given in the table below:

Residual maturity	Price	Face value
1 year	$91.74	$100
2 year	$82.64	$100

Select the most appropriate statement.

A. The market expects the interest rates to fall, therefore the yield curve is downward sloping.

B. The market expects the interest rate to rise, therefore the yield curve is upward sloping.

C. The market expects the interest rate to remain constant, therefore the yield curve is flat.

D. The yield curve is always downward sloping.

Q.1011 If the term structure of spot interest rates is flat, then the term structure of forward interest rates must be:

A. Upward sloping

B. Downward sloping

C. Flat

D. Humped shaped

Q.1012 Jack Mangers observes that the spot rates for 2 years and 3 years are 6% and 8% respectively while the 2y1y (1-year forward rate beginning after 2 years) rate is 12.50%. Select the correct statement(s) from the following.
I. There is an opportunity to generate riskless profit
II. There is no opportunity to generate riskless profit
III. The yield curve is upward sloping
IV. The yield curve is downward sloping

A. Both I and IV are correct.

B. Both II and III are correct.

C. Both I and III are correct.

D. Both II and IV are correct.

Q.1013 Jack Mangers observes that the spot rates for 2 years and 3 years are 6% and 8% respectively while the 2y1y (1-year forward rate beginning after 2 years) rate is 12.50%. Select the most appropriate option.

A. As there is no interest rate discrepancy, no transaction can generate riskless profit.

B. Borrowing funds for 3 years, lending the funds for 2 years and an agreement to lend funds for 1 year after 2 years will generate a riskless profit of $0.43 per $100.

C. Lending funds for 3 years, borrowing the funds for 2 years and an agreement to lend funds for 1 year after 2 years will generate riskless profit of $0.50 per $100.

D. Borrowing funds for 3 years, lending the funds for 2 years and an agreement to lend funds for 1 year after 2 years will generate riskless profit of $0.70 per $100.

Q.1014 The details of a bond currently trading is given below:
Face value: $1,000
Coupon: 6%
YTM: 6%
Tenure: 10 years

The price of the bond is:

A. $1,100

B. 990

C. $1,000

D. 980

Q.1015 A rate of 5% is quoted with continuous compounding. What is the equivalent rate, quoted with monthly compounding?

A. 5.01%

B. 6.03%

C. 6.02%

D. 5.59%

Q.1016 The 5-year and 6-year continuously compounded interest rates are 6.75% and 7.25%, respectively. What is the forward rate of interest between year five and year six?

A. 9.75%

B. 8.25%

C. 7.50%

D. 8.56%

Q.2781 In the table below, an analyst has summarized the current swap rates prevailing on the market.

Term in Years	Swap Rate
0.5	2.00%
1.0	2.80%
1.5	3.20%

What is the 1.5-year discount factor?

A. 0.9533

B. 0.9625

C. 0.9725

D. 0.9804

Q.2783 After a recent FED's announcement, a trader observed significant changes across the whole spot rates curve. The correct spot rates are as follows:

Year	Spot rate
0.5	2.0%
1.0	2.1%
1.5	2.3%
2.0	2.2%
2.5	2.5%

What is the 6-month forward rate in two years?

A. 0.30%

B. 1.85%

C. 2.21%

D. 3.70%

Q.2785 Par rates prevailing on the market, are:

Term in years	Par Rates
0.5	1.60%
1.0	2.00%
1.5	2.60%
2.0	3.20%

What is the two-year discount factor? (Assume semiannual coupons.)

A. 0.9871

B. 0.9619

C. 0.9421

D. 0.9380

Q.3421 The price of a five-year zero-coupon government bond is $72.25. The price of a similar six-year bond is $67.34. The one-year implied forward rate from year 5 to year 6 is closest to:

A. 7.29%

B. 7.00%

C. 6.79%

D. 6.24%

Q.3422 The term structure of swap rates is:

n − year	Swap rate
1 − year	3.5%
2 − year	4%
3 − year	4.5%
4 − year	5%
5 − year	5.5%

The two-year forward swap rate starting in three years is closest to:

A. 0.5%

B. 4%

C. 7.02%

D. 6.22%

Q.3423 Below is the term structure for swap rates:

Maturity in Years	Swap Rate
1	4.0%
2	4.5%
3	5.0%
4	5.5%
5	6.0%

The 1-year forward swap rate starting in four years is closest to:

A. 4.0%

B. 6.0%

C. 7.0%

D. 8.0%

Q.4572 A trader invests $100 million in a savings account. After two years, the total amount in his account is $150 million. What is the rate of interest compounded semi-annually?

A. 20.32%

B. 21.34%

C. 22.47%

D. 25.32%

Q.4573 If the one-year spot rate is 5% and the two years spot rate is 8%, what is the one-year forward rate, one year from now?

A. 0.0555

B. 0.111

C. 0.067

D. 0.134

Q.4574 1000 is invested in an account that pays an annual nominal interest of 8% compounded quarterly per year. What is the value of the amount in the account after three years?

A. 1259.71

B. 1268.24

C. 1061.21

D. 2518.17

Q.4575 Suppose a company is obliged to make annual payments of $5,000 for the premises it occupies. Payments are due on 1st January 2001, 1st January 2002, and 1st January 2003. If the company wishes to cover these payments by investing a single sum in its bank account that pays 8% per annum compound, what sum must be invested on 1st January 2000?

A. 12,885.48

B. 14,853.44

C. 13,916.32

D. 11,298.56

Q.4576 Spot rates with semi-annual compounding are as below:

Maturity (years)	Spot rates (%)
1.0	2.0
1.5	2.5
2.0	3.0

What the forward rate for the period between time 1.0 and 1.5, expressed annually?

A. 0.035

B. 0.0175

C. 0.07

D. 0.005

Q.4577 Spot rates with semi-annual compounding are as below:

Maturity (years)	Spot rates (%)
1.0	2.0
1.5	2.5
2.0	3.0

What is the forward rate for the semi-annual period between time 1.5 and 2, expressed annually?

A. 0.045

B. 0.0225

C. 0.09

D. 0.0977

Reading 55: Bond Yields and Return Calculations

Q.1017 Yield-to-maturity is an important measure to describe the pricing of a bond. Which of the following statements are true with regard to yield-to-maturity?
I. Yield-to-maturity is the single rate such that discounting a security's cash flows at that rate gives that security's market price
II. When the coupon rate exceeds the yield, the bond sells at a discount to its face value
III. When the yield exceeds the coupon rate, the bond sells at a premium to its face value
IV. If the term structure is flat, so that all spot rates and all forward rates equal some single rate, then the yield-to-maturity of all bonds equals that rate as well

A. I & IV only.

B. II, III & IV only.

C. I, II & IV only.

D. All of the above.

Q.1018 Derek Johnson, an analyst at American Bonds Inc., is interested in understanding the components of P&L (Profit & Loss) of bonds. With regards to P&L, which of the following statements are true?
I. P&L is generated by price appreciation plus cash-carry, which consists of explicit cash flows like coupon payments and financing costs
II. P&L due to carry is meant to convey how much a position earns due to the fact that, as a security matures, its cash flows are priced at earlier points on the term structure
III. P&L due to roll-down is meant to convey how much a position earns due to the passage of time, holding everything else constant
IV. The P&L due to the passage of time excluding cash-carry is called carry-roll-down

A. I & IV only.

B. II & IV only.

C. I, II & IV only.

D. All of the above.

Q.1019 Consider the details of bonds currently trading:

Bond	Coupon	YTM	Face Value
Bond A	10%	9%	1000
Bond B	6%	8%	1000
Bond C	5%	5%	1000

Select the most appropriate statements:I. $Price_{Bond\ A} > \$1000$
II. $Price_{Bond\ B} < \$1000$
III. $Price_{Bond\ C} = \$1000$
IV. $Price_{Bond\ A} < \$1000$
V. $Price_{Bond\ B} > \$1000$
VI. $Price_{Bond\ C} > \$1000$

A. II, III and V are correct.

B. I, II and III are correct.

C. IV, V and VI are correct.

D. I, III and V are correct.

Q.1020 All the following statements regarding the yield-to-maturity (YTM) are correct, EXCEPT:

A. The YTM is the discount rate used to discount the bond cash flows to arrive at the price of the bond.

B. The YTM is the return realized by the bond investor.

C. The YTM of a zero-coupon bond is equal to the spot rate.

D. If YTM < Coupon, the bond trades at a premium.

Q.1021 Corporate bonds trade at a positive spread to government bonds because:

A. Corporate bonds are more liquid than government bonds.

B. Corporate bonds have higher credit risks than government bonds.

C. Corporate bonds generate higher returns than government bonds.

D. Corporate bonds pay less coupon than government bonds.

Q.1022 Consider the following details with respect to a bond:
Face value: $1000
Coupon: 10%
Frequency: Semi-annually
Coupon payment dates: January 1st and July 1st

An investor buys the bond on January 22nd at a price of $990.23, and sells it on August 3rd at $1030.34. The gross realized return on the bond investment is:

A. 4.05%

B. 9.1%

C. 8.8%

D. 9.4%

Q.1023 Consider the following details with respect to a bond:
Face value: $1000
Coupon: 10%
Frequency: Semi-annually
Coupon payment dates: January 1st and July 1st

An investor buys this bond at $1043.43 on January 1st, 2016 and sells it on January 1st, 2017 at $995.23. The coupon received is reinvested at a semi-annually compounded rate of 9%. The realized gross holding period return is:

A. 0.39%

B. 5.2%

C. 4.5%

D. 5.6%

Q.1024 A corporate bond has a residual maturity of 2 years and pays a 10% coupon annually.
Two zero-coupon bonds are currently trading at the price mentioned below:

Price	Residual maturity
USD 92.38	1 year
USD 84.17	2 years

The price of the corporate bond is closest to:

A. USD 101.01

B. USD 117.66

C. USD 101.82

D. USD 93.41

Q.1025 A bond with a residual maturity of 2 years that pays a 10% coupon annually is currently trading at $102.10. It is also observed that two zero-coupon bonds are currently trading at the price mentioned below:

Price	Residual maturity
$92.38	1 year
$84.17	2 years

The transaction which will generate riskless profit is:

A. Sell the bond and purchase the zero-coupon bonds.

B. Borrow funds and purchase the zero-coupon bonds.

C. Riskless profit cannot be generated.

D. Buy the bond and sell the zero-coupon bonds.

Q.1026 A fund manager is looking for an opportunity to invest in sovereign bonds. Country A has recently witnessed a major economic recession and has just averted a default on its foreign debt. On the other hand, country B is a developing economy with a low debt to GDP ratio. The bonds of country A and B trade at a spread of a and b with respect to US Treasury bonds.
Select the correct option:

A. $a > b$

B. $a < b$

C. $a = b$

D. $a \leq b$

Q.1027 The bonds of country A is trading at a spread of x with respect to US Treasury bonds in country B and at a spread of y with respect to US Treasury bonds in country C. A relative value trader wants to generate returns by trading in bonds of country A. If x > y, then the trade must be:

A. To buy the bond in country B and sell it in country C.

B. To buy the bond in country C and sell it in country B.

C. To sell the bond in country B and C.

D. To buy the bond in country B and C.

Q.2786 Aram Bauer is considering an investment in fixed income instruments. He is interested in a U.S. Treasury tranche as of December 31, 2019. The tranche pays coupons of 4.5% per year compounded semiannually. The price of this tranche as of December 31, 2016, is 97.124.

What is the yield to maturity of the tranche?

A. 2.78%

B. 3.22%

C. 5.55%

D. 6.44%

Q.2787 On Jan 1 2017, Commercial Bank of India issued a six-year bond paying an annual coupon of 6% at a price reflecting a yield to maturity of 4%. As of 31 Dec 2017, interest rates remain unchanged. Holding all other factors constant, and assuming a flat term structure of interest rates, how was the bond's price affected? The price:

A. Remained constant.

B. Decreased.

C. Increased.

D. Increased, but only in the second half of the year.

Q.2788 A trader borrows $3,000,000 with a term of two years at a simple annual interest rate of 2% from his broker. He purchases at par a bond with a 5% coupon paid annually. The bond matures exactly in 10 years. Two years later, the trader sells the bond at the price of $101 and repays the loan on an annual basis. Assuming that all of the coupons received are reinvested at the rate of 1.5%, for a period of 1 year, what is the trader's net realized return on the transaction described above?

A. +7.0000%

B. +7.0750%

C. +11.0000%

D. +11.0750%

Q.2789 Alice Tuck invested her annual bonus in a bond with a face value of $55,000. The bond pays a 5% coupon semiannually and matures in 10 years. At the purchase date, the bond had a yield to maturity of 7%. Six months later Alice received the coupon and sold the bond at the market yield of 6.5%. What is the net realized return on Alice's transaction?

A. +7.0000%

B. +7.1250%

C. +7.2312%

D. +7.5475%

Q.3424 At the start of the year, a bank issues a non-zero-coupon bond maturing in five years. During the year, the following events are recorded:

I. The bank's leverage ratio increases
II. The bank's business risk increases
III. The rate of interest earned on government bonds and T-bills increases

Which of the above-mentioned events would be expected to increase the bond's yield to maturity?

A. I only

B. I and II only

C. III only

D. I, II, and III

Q.3425 Bank A and Bank B both have a credit rating of BBB. Bank A issues a fixed-rate bond with a 10-year term to maturity, while Bank B issues a similar bond with a 5-year term to maturity. Holding all other factors constant, which of the following statements is *most likely* true?

A. Bond A has a higher interest rate risk than bond B

B. Bond B has a higher interest rate than bond A

C. Bond A has a lower coupon rate than bond B

D. Bond B has a higher coupon rate than bond A

Q.3426 On Jan 1 2017, a 5-year corporate bond, paying an annual coupon of 8%, was selling at a discount. As of 31 Dec 2017, interest rates remain unchanged. Holding all other factors constant, which of the following relationships holds true? (P_0 represents the price of the bond and YTM is the bond's yield to maturity.)

A. $P_0 <$ par and YTM $< 8\%$

B. $P_0 <$ par and YTM $> 8\%$

C. $P_0 >$ par and YTM $> 8\%$

D. $P_0 >$ par and YTM $< 8\%$

Q.4582 A zero-coupon bond with three years to maturity has a face value of 100. If the current market price of the bond is 88, what is the yield to maturity of the bond?

A. 12%

B. 13.6%

C. 4.35%

D. 3.79%

Q.4583 An investor buys a two-year 100 par-value bond at $95 per $100 face value. The bond pays semiannual coupons at a rate of 5% per annum. Suppose that after six months, the coupon is invested and earns 2% for the next 6 months. After 1 year, the investor decides to cash out and sell the bond at $97. What is the gross realized return for the investor?

A. 7.37%

B. 7.42%

C. 4.22%

D. 2.11%

Q.4584 Suppose that James is offered a bond that pays $40 per annum in perpetuity. If the discount rate is 6%, what is the bond's expected price?

A. 600

B. 666.67

C. 667.77

D. 666

Q.4585 What is the present value of an annuity that pays $100 per year at the end of each year for the next five years at an effective rate of 5% per annum?

A. 435

B. 432.95

C. 495

D. 487.98

Reading 56: Applying Duration, Convexity, and DV01

Q.659 On a graduate-level exam on the subject of fixed income investments, students were asked to define duration in three sentences. One of the students mentioned the following three sentences associated with duration:
I. The duration of a zero-coupon bond is a measure that tells how long on average the holder of the bond has to wait until the bond is redeemed for its full face value.
II. Since there are no coupons in a zero-coupon bond, the zero-coupon bond does not have duration.
III. The duration of a coupon bond is equal to its time to maturity.

Which of the sentences are inconsistent with the definition of duration?

A. Statements I and II are inconsistent with the definition of duration.

B. Statements II and III are inconsistent with the definition of duration.

C. Statements I and III are inconsistent with the definition of duration.

D. All of the statements are inconsistent with the definition of duration.

Q.1175 The price of a bond at various rates is given in the table below:

Spot rate	Price
3.45%	95.8680
3.40%	96.0780

The DV01 of the bond is:

A. 11.04

B. 1.10

C. 0.042

D. 0.906

Q.1176 The price of a bond at various rates is given in the table below:

Par rates	price
3.45%	95.8680
3.40%	96.0780
3.35%	96.3210

The duration of the bond is:

A. 0.4719

B. 4.7149

C. -4.7149

D. 0.04719

Q.1177 The price of a bond at various rates is given in the table below:

Spot rate	Price
3.45%	95.8680
3.40%	96.0780
3.35%	96.3210

Select the most appropriate statement from the following.

A. The duration is the same at 3.00% and at 3.40%.

B. The duration is greater at 3.00% as compared to at 3.40%.

C. The duration is smaller at 3.00% as compared to at 3.40%.

D. Duration remains unaffected by the level of interest rates.

Q.1178 A fund manager has the option to buy the following bonds:

I. A bond with a coupon of 10% and a tenure of 5 years
II. A bond with a coupon of 5% and a tenure of 5 years

If the fund manager wants to limit the impact of interest rate changes in his portfolio, the ideal bond(s) to invest in is/are:

A. The bond with the 10% coupon.

B. The bond with the 5% coupon.

C. Both bonds, since they react in a similar manner to interest rate changes.

D. Both bonds, since the diversification effect will reduce the impact of interest rate changes.

Q.1179 A fund manager has the option to buy the following bonds:

I. A bond with 10% coupon and a tenure of 15 years
II. A bond with 10% coupon and a tenure of 10 years
III.

The fund manager expects the interest rate volatility to increase and wants to compose a portfolio which will help him generate maximum return due to the volatility. The fund manager must buy:

A. The bond with a tenure of 15 years.

B. The bond with a tenure of 10 years.

C. Both, since they react in a similar manner to interest rate volatility.

D. Both, since the diversification effect will help him generate maximum return.

Q.1180 All the following are true for convexity, EXCEPT:

A. Convexity is the second derivative of the price rate function.

B. For an option free bond, convexity is always negative.

C. Convexity explains why the price of a bond falls less and rises more in the case of changes in interest rates.

D. Convexity enhances the bond's return.

Q.1181 Details of portfolio X is given below: Note: Portfolio X consists of bonds A, B, C and D, and the value of each bond is given in the above table. The duration of portfolio X is:

Bond	Value	Duration	Convexity
Bond A	$120,000	5.453	230.453
Bond B	$100,000	7.213	350.361
Bond C	$150,000	2.348	120.714
Bond D	$130,000	8.190	480.341

A. 5.26

B. 5.59

C. 5.10

D. 5.69

Q.1182 Details of portfolio X is given below:

Bond	Value	Duration	Convexity
Bond A	$120,000	5.453	230.453
Bond B	$100,000	7.213	350.361
Bond C	$150,000	2.348	120.714
Bond D	$130,000	8.190	480.341

Note: Portfolio X consists of bonds A, B, C and D, and the value of each bond is furnished in the above table.
The convexity of portfolio X is:

A. 360.426

B. 386.484

C. 200

D. 286.484

Q.1183 Data on three bonds are given below. Assume the current date is March 31, 2015.

Bond	Maturity	Price	Yield	Duration	Convexity
A	March 31, 2020	110.321	2.32%	4.321	34.09
B	March 31, 2030	109.320	3.23%	9.102	78.32
C	March 31, 2045	103.211	4.11%	18.112	323.11

The fund manager is considering purchasing $10 million (face value) of bonds B at the cost of $10.932 million. The fund manager expects the interest volatility to increase and hence wants to maximize his returns. However, another fund manager makes the suggestion that instead of investing in bond B, the fund manager should invest in a combination of bonds A and C. Given that the fund manager has a surplus of $10.932 million and wants the duration of the portfolio to be equal to that of bond B, the investments in A and C which can create a portfolio with a duration similar to B is:

A. $5.34 million in bond A and $5.592 million in bond C.

B. $9.321 million in bond A and $1.611 million in bond C.

C. $7.14 million in bond A and $3.79 million in bond C.

D. $8.12 million in bond A and $2.812 million in bond C.

Q.1184 Data on three bonds are given below. Assume the current date is March 31, 2015.

Bond	Maturity	Price	Yield	Duration	Convexity
A	March 31, 2020	110.321	2.32%	4.321	34.09
B	March 31, 2030	109.320	3.23%	9.102	78.32
C	March 31, 2045	103.211	4.11%	18.112	323.11

The fund manager is considering purchasing $10 million (face value) of bonds B at the cost of $10.932 million. The fund manager expects the interest volatility to increase and hence wants to maximize his returns. However, another fund manager makes the suggestion that instead of investing in bond B, the fund manager should invest in a combination of bonds A and C. The fund manager has a surplus of $10.932 million and wants the duration of the portfolio to be equal to that of bond B. Given that the fund manager expects increased interest volatility, the fund manager should invest in:

A. $10.932 million of Bond B.

B. $10.932 million of Bond C.

C. $5.12 million of bond A and $5.81 of bond C.

D. $7.14 million of bond A and $3.79 of bond C.

Q.1185 Data on three bonds are given below. Assume the current date is March 31, 2015.

Bond	Maturity	Price	Yield	Duration	Convexity
A	March 31, 2020	110.321	2.32%	4.321	34.09
B	March 31, 2030	109.320	3.23%	9.102	78.32
C	March 31, 2045	103.211	4.11%	18.112	323.11

The return generated by a portfolio consisting of $7.14 million of bond A and $3.79 million of bond C in the case the interest rate remains constant is:

A. 0.0232

B. 0.0411

C. 0.0294

D. 0.0151

Q.2791 Suppose the yield on a zero-coupon bond declines from 5.00% to 4.99%, and the price of the zero increases from $50.0 to $51.5. Compute the DV01.

A. $0.0512

B. $1.5

C. $2.5

D. $0.1

Q.2792 Ted Oster wants to calculate the DV01 of a new position in a bond with a face value of $1,000,000. The bond was bought today for $84.102 for $100 face value. Oster knows that the Macaulay duration is 5.25.

What is the DV01 of the position if the bond has a yield to maturity of 10% per annum?

A. $401.39

B. $405.40

C. $483.47

D. $492.73

Q.2794 A trader at an investment bank sold to the corporate client $10,000,000 worth of non-standardized call options on bonds. The DV01 of the option is 0.1011. The trader wants to hedge the options using the same option's underlying bonds that has a DV01 of 0.2455.

What is the bank's hedging transition?

A. Sell $4,118,000 face value of U.S. Treasury 3s of December 31, 2020.

B. Buy $4,118,000 face value of U.S. Treasury 3s of December 31, 2020.

C. Sell $2,428,000 face value of U.S. Treasury 3s of December 31, 2020.

D. Buy $2,428,000 face value of U.S. Treasury 3s of December 31, 2020.

Q.3315 Peter Drury, a risk manager at Capital Bank, is evaluating the price sensitivity of an investment-grade callable bond using the bank's valuation system. The table below gives a breakdown of the bond and the embedded option. The current interest rate environment is flat at 5%.

Interest rate level	Bond value per 100 USD face value	Call option value per 100 USD face value
4.95%	98.2520	1.7480
5.0%	98.0000	1.5000
5.05%	97.7500	1.3225

The DV01 of a comparable bond with no embedded options and with the same maturity and coupon rate as the collable bond is closest to:

A. 0.09275

B. 0.08015

C. 0.1285

D. 0.07500

Q.3319 An investment company is exposed to a portfolio of bonds. The duration of the portfolio is 8.83 and the convexity of the portfolio is 6.43. What is the change in the price of the portfolio for a one percentage point increase in the interest rate?

A. -5.5%

B. 2.4%

C. -4.4%

D. -8.8%

Q.3427 Given the following portfolio of bonds:

Bond	Price	Par Amount Held (USD Million)	Modified Duration
A	101.22	4	2.45
B	85.53	6	4.25
C	115.50	9	7.61

What is the value of the portfolio's DV01 (dollar value of a basis point)?

A. $10,960

B. $11,000

C. $11,060

D. $12,600

Q.3428 The current interest rate environment in a certain developing economy is flat at 5%. A risk manager has compiled the following data regarding a callable bond in two other interest rate environments (all values in USD per USD 100 face value):

Level of interest rate	Callable bond	Call option
4.96%	102.00	2.0893
5.00%	102.4465	2.0255
5.04%	101.2111	2.0021

The convexity of the callable bond is closest to:

A. -102,608

B. -51,304

C. -100,020

D. -103,000

Q.3429 A 20-year zero-coupon bond is callable annually at par, starting at the beginning of year 11. Assuming a flat yield curve of 20%, the bond's duration is closest to:

A. 20 years

B. 15 years

C. 10 years

D. Cannot be determined based on the data given

Q.4609 In the context of the one-factor risk metrics, which of the following is/are correct?

I. DV01 and effective duration hedging provide protection against small parallel shifts of the term structure
II. DV01 and effective hedging protect against large parallel shifts of the term structure
III. A combination of the convexity and effective duration protects against large parallel shifts in the term structure
IV. Effective convexity hedging protects against small parallel shifts in the term structure

A. I and IV

B. I and III

C. III only

D. I and II

Q.4611 A bank has a position of USD 2 million with a duration of 10 years. To completely hedge its position, the bank takes a short position of USD 1.4 million in bond B. What is the duration of bond B?

A. 10

B. 11

C. 13

D. 14

Q.4613 Suppose the yield on a zero-coupon bond declines from 7.00% to 6.95% and the price of the zero increases from $202.45 to $203.87. What is the value of DV01?

A. 0.342

B. 0.324

C. 0.284

D. 0.242

Q.4614 The Macaulay duration of a coupon bond is 10.25. If the yield on the bond is 8% compounded semi-annually, what is the corresponding modified duration for the bond?

A. 10.25

B. 9.86

C. 11.45

D. 9.54

Q.4615 A four-year Treasury bond has a face value of USD 5 million and an annual coupon payment of 8% paid semi-annually. The term structure applicable to the bond is a 10% flat yield. Considering ten basis point changes, what is the effective convexity of the bond?

A. -13.68

B. 13.68

C. -203.67

D. 203.67

Q.4616 A bond portfolio consists of three bonds:

- Bond A worth 9 million with a duration of 4;
- Bond B worth 5 million with a duration of 6; and
- Bond C worth 6 million with a duration of 7.

What is the effective duration of the portfolio?

A. 7.8

B. 6.6

C. 5.4

D. 5.7

Q.4617 A position worth USD 3 million has a duration of 4 and a convexity of 5. What is the estimated change in the position for a five-basis-point increase in all rates?

A. Increase by USD 5,998.125

B. Decrease by USD 5,998.125

C. Increase by USD 5,546.670

D. Decrease by USD 5,546.670

Reading 57: Modeling and Hedging Non-Parallel Term Structure Shifts

Q.1148 All the following are assumptions of Key Rate Shifts, EXCEPT:

A. Rates can be determined as a function of a relatively small number of key rates.

B. There is a parallel shift of rates across the key rates.

C. There is a linear shift of rates across the term structure.

D. The rate of a given term is not affected by its neighboring key rates.

Q.1149 An investor who buys a payer swaption:

A. Has the right to pay the fixed rate on a swap at some time in the future.

B. Has the right to pay the floating rate on a swap at some time in the future.

C. Has the right to receive the fixed rate on a swap at some time in future.

D. None of the above.

Q.2605 An analyst has gathered the following data on the prices of a 10-year zero-coupon bond simulated for shifts in three key rates:

	Value
Initial Curve	103.300
2-year Shift	102.755
5-year Shift	102.504
10-year Shift	102.303

What is the key rate duration for a 10-year shift?

A. 19.61

B. 23.20

C. 96.52

D. 99.70

Q.2606 A risk manager prepares a presentation on the interest rate risk of the bank's bond portfolio. The table below shows the value of the portfolio in case of shifts in key rates by one basis point and corresponding key rate duration.

	Value	Key Rate Duration
Initial Curve	500.425	
2-year Shift	500.227	3.957
5-year Shift	500.201	4.476
10-year Shift	?	28.476
30-year Shift	499.500	18.484
Total		55.393

What is the value of the portfolio in the case of a 10-year shift?

A. 501.850

B. 500.043

C. 499.500

D. 499.000

Q.2607 Frank Capper wants to estimate the impact of key rate changes on the value of C-STRIPs. Capper uses 2-year, 5-year, 10-year, and 30-year key rates in his analysis. He also wants to incorporate an unexpected 50 basis point shock of the 10-year rate in the model.

Which of the following rates will be affected by the change of the 10-year rate key rate?

A. 2-year and 5-year

B. 30-year rate

C. 5-year and 30-year rates

D. All of the rates will be affected

Q.2610 A trader wants to hedge the 2-year and 5-year rates exposure of a portfolio. To perform the hedge, the trader can use Bond 1 and Bond 2 presented below.

	Key Rate '01 (per 100 face amount)	
Hedging Bonds	2-year	5-year
Bond 1	0.0080	–
Bond 2	0.0099	0.0160

	Key Rate '01($)	
	2-year	5-year
Fixed Income Portfolio	250	320

What is the face value of Bond 1 required to perform the hedge?

A. $200,000

B. $650,000

C. $950,000

D. $1,250,000

Q.2611 The risk manager of a regional bank is concerned with possible shocks in short-term rates. He wants to find a transaction that will completely eliminate the 2-year exposure and decrease by half the current 5-year exposure. A trader proposes the following two bonds as hedging instruments:

	Key Rate '01 (per 100 face amount)	
Hedging Bonds	2-year	5-year
Bond 1	0.0010	0.0050
Bond 2	0.0015	0.0025

	Key Rate '01($)	
	2-year	5-year
Fixed Income Portfolio	1,000	4,000

What is the trader's hedging transaction?

A. Sell $60,000,000 of bond 1; Sell $10,000,000 of bond 2.

B. Sell $10,000,000 of bond 1; Sell $60,000,000 of bond 2.

C. Sell $10,000,000 of bond 1; Buy $60,000,000 of bond 2.

D. Buy $60,000,000 of bond 1; Sell $60,000,000 of bond 2.

Q.2612 The head of the trading department of a bank suggests speculating on the interest rate curve by eliminating the exposure of the bond portfolio to long-term rates (10-year and 30-year rates) and increasing the exposure to medium-term rates. The table below represents the key rate '01s of the current portfolio and corresponding hedging instruments.

	Key Rate '01 (per 100 face amount)		
Hedging Bonds	5-year	10-year	30-year
Bond 1	0.0050	–	–
Bond 2	0.0170	0.0250	–
Bond 3	0.0100	0.0300	0.0350

	Key Rate '01($)		
	5-year	10-year	30-year
Fixed Income Portfolio	1,000	2,000	1,500

What will be the portfolio's 5-year exposure after hedging 10-year and 30-year exposures?

A. $85.70

B. $171.43

C. $8,570.00

D. $17,143.00

Q.2613 The risk manager at a regional bank is trying to interpret the results of an interest rate curve shocks simulation. The table below represents the key rate '01s for the fixed income portfolio of the bank.

	Value	Key Rate '01
Initial Curve	2,000.000	
2-year Shift	1,998.500	1.500
5-year Shift	1,998.300	1.700
10-year Shift	1,999.000	1.000
30-year Shift	1,998.000	2.000
Total		6.200

What is the approximate value of the portfolio in the case of a 5 basis point increase of the 2-year rate and a 10 basis point increase of the 30-year rate?

A. 1,972.500

B. 1,980.000

C. 1,992.500

D. 1,996.500

Q.2614 Anna White, head of the risk management department of a regional bank, asks one of the interns to analyze the volatility of the bank's medium-term fixed-income portfolio with a value of $10,000. For the analysis of the portfolio, the intern uses 2-year rates (annual volatility of 20%) and 5-year rates (annual volatility of 30%). He calculates that the key rate '01s for 2-year and 5-year shifts are 2 per $ 100 and 5 per $ 100 respectively.

What is the volatility of the portfolio if the correlation between 2-year and 5-year rates is 0.45?

A. $155.24

B. $171.76

C. $22,570.00

D. $29,500

Q.2615 Initially, a fixed income portfolio of an investment bank had the following key rate ‘01s:

	Value	Key Rate
Initial Curve	10,000	
2-year Shift	9,990	10
5-year Shift	9,985	15
10-year Shift	9,981	19
30-year Shift	9,984	16
Total		60

After a recommendation from the risk management department, a trader completely hedged the 30-year exposure with a bond that had the following characteristics:

Hedging Bond	Key Rate '01 (per USD 100 face value)
Initial Curve	
2-year Shift	–
5-year Shift	–
10-year Shift	3
30-year Shift	4

How much will the bank save, if immediately after the hedge, the interest rate curve experienced a 20 basis point upward parallel shift?

A. 320

B. 360

C. 480

D. 560

Q.3430 Kelvin Mertens, FRM, regularly participates in bond trading in the US. He is using key rate analysis to assess the effect of yield changes on bond prices. He finds that the 20-year yield has increased by 10 basis points. Moreover, this shock decreases linearly to zero for the 30-year yield. What is the effect of this shock on the 26-year yield?

A. Increase of zero basis points

B. Increase of six basis points

C. Increase of ten basis points

D. Increase of four basis points

Q.3431 The following table provides the initial price of a C-STRIP and its present value after the application of a one basis point shift in four key rates.

	Value
Initial value	26.14485
2-year shift	26.14582
5-year shift	26.14885
10-year shift	26.14885
30-year shift	26.02192

The key rate '01 with respect to the 10-year shift is closest to:

A. -0.004

B. -0.04

C. -4

D. -0.4

Q.3432 The following table provides the initial price of a C-STRIP and its present value after the application of a one basis point shift in four key rates.

	Value
Initial value	26.11485
2-year shift	26.11582
5-year shift	26.11885
10-year shift	26.13885
30-year shift	26.01192

The key rate duration with respect to the 30-year shift is closest to:

A. 39

B. 51

C. 38

D. 10

Reading 58: Binomial Trees

Q.1205 Australian Financial Associates is holding the non-dividend paying stock of Neevan Holdings which is trading at USD 10. The continuously compounded risk-free rate is 5 percent per annum, and the annual standard deviation of the stock is 20 percent. What is the value of a 2-year European call option with a strike price of USD 10 using a two-period binomial model?

A. USD 1.64

B. USD 1.48

C. USD 1.58

D. USD 1.69

Q.1207 Chris Fleming, an analyst working at Redberg Financials, constructs binomial trees to price options. With regard to binomial trees for pricing options, which of the following statement(s) is/are true?
I. The underlying assumption in constructing a binomial tree is that the stock price follows a random walk
II. In the limit, as the time step increases, the binomial tree model valuation of a European option converges to the Black-Scholes-Merton model valuation
III. An inspection of a typical binomial tree shows that Delta remains constant during the life of an option
IV. Constructing binomial trees for valuing options on stock indices, currencies, and futures contracts is very similar to doing so for valuing options on stocks

A. I, III & IV only

B. I, II & IV only

C. II, III & IV only

D. All of the above

Q.1210 David Yung, an analyst working at the New Zealand Bank, uses Girsanov's Theorem to study portfolios in a risk-neutral world and in the real world. The Girsanov's Theorem states that:

A. When we move from the risk-neutral world to the real world, the expected return from the stock price changes, but its volatility remains the same.

B. When we move from the risk-neutral world to the real world, the expected return from the stock price remains the same, but its volatility changes.

C. When we move from the risk-neutral world to the real world, both the expected return from the stock price and its volatility remains the same.

D. When we move from the risk-neutral world to the real world, both the expected return from the stock price and its volatility change.

Q.1211 Australian Financial Associates is holding the non-dividend paying stock of Neevan holdings which is trading at USD 10. The continuously compounded risk-free rate is 5 percent per year, and the annual standard deviation of the stock is 20%. What is the value of a 2-year European put option with a strike price of USD 10 using a two-period binomial model?

A. USD 0.5323

B. USD 2.4356

C. USD 0.6884

D. USD 2.3456

Q.1212 Which of the following statement(s) is/are true with regard to Delta?

I. Delta is an important parameter in the pricing and hedging of options
II. Delta is the number of units of the stock we should hold for each option shorted in order to create a riskless portfolio
III. The construction of a riskless portfolio is sometimes referred to as delta hedging
IV. The delta of a call option is negative, whereas the delta of a put option is positive

A. I, II & III only

B. I, II & IV only

C. II, III & IV only

D. All of the above

Q.1213 Rose Associates is holding stocks of Xerox limited. The current value of the stock is USD 100 and the current continuously compounded risk-free rate is 3 percent. The stock pays a dividend at a continuous dividend yield of 2 percent. The annual standard deviation of the stock is 9 percent. What is the risk-neutral probability of an up-move and down-move for a 1-year European call option on the stock?

A. 0.68 and 0.32

B. 0.78 and 0.22

C. 1.09 and 0.91

D. 0.53 and 0.47

Q.3400 Willy Smith, FRM, has a two-year European put with K = $41. The current price of the underlying is $40. Over the past year, the stock has exhibited a standard deviation of 20%. The risk-free rate of return is 5%. Compute the value of the put today using a two-step Binomial.

A. $2.71

B. $3

C. $0

D. $16.1

Q.3402 XYZ stock is a non-dividend-paying stock currently priced at $108. According to analysis, the annual standard deviation of returns on XYZ stock is 8% and the risk-free rate on interest, compounded continuously, is 5.5%. Using a two-period binomial model, compute the value of a 6-month American call option on XYZ stock with a strike price of $110.

A. $2.43

B. $7.04

C. $2.98

D. $4.58

Q.3403 You have been provided the following information for a call option on the stock of VeloMedia:

- Current stock price = $100
- Strike price = $100
- Time to maturity = 1 year
- Exponential compounding interest rate = 10%
- Annual standard deviation = 30%

What is the value of a European call option using a two-period binomial tree with two distinct intervals of 6 months?

A. $15.38

B. $10.21

C. $0

D. $5.86

Q.3404 You have been provided the following information for a European call option on the stock of VeloMedia:

- Current stock price = $100
- Strike price = $100
- Time to maturity = 1 year
- Exponential compounding interest rate = 10%
- Annual standard deviation = 30%

What is the call option delta at the current date? Use a two-period binomial tree with two distinct intervals of 6 months.

A. 0

B. 0.6669

C. 1

D. 0.5

Q.3405 You have been provided the following information for a put option on the stock of VeloMedia:

- Current stock price = $100
- Strike price = $100
- Time to maturity = 1 year
- Exponential compounding interest rate = 10%
- Annual standard deviation = 30%

Compute the value of the European put option using a two-period binomial tree with two distinct intervals of 6 months.

A. $15.38

B. $5.86

C. $0

D. $10

Q.3406 A call option has a delta of 0.65. What is the put option delta?

A. -0.65

B. -0.35

C. 0.35

D. None

Q.4697 The current price of a stock is $40. Its volatility is 10% per annum and the risk-free rate is 5% per annum with continuous compounding. Using a two-step binomial, what is the value of a six-month European call option on the stock with a strike price of $40?

A. 1.54

B. 2.0

C. 1.58

D. 1.83

Q.4698 A 6-month stock currently trading at $40 pays a continuous dividend of 2%, and the current continuously compounded risk-free rate is 3%. Assuming an annual standard deviation of 3%, and a strike price of 40, what is the value of the put today?

A. 0.32

B. 0.28

C. 0.51

D. 0.52

Reading 59: The Black-Scholes-Merton Model

Q.984 Antony Meech, a research analyst working at FinSearch Inc., is preparing a note on lognormal distributions and normal distributions. He notes down the following points on lognormal distribution:
I. The model of stock price behavior used by Black, Scholes, and Merton assumes that percentage changes in the stock price in a very short period of time are normally distributed
II. A variable that has a lognormal distribution can take any value between zero and infinity
III. Like the normal distribution, the mean, median, and mode are all the same in the lognormal distribution

Which of them are correct?

A. I & II only

B. II & III only

C. I, II & III only

D. I & III only

Q.985 Ricky Gervais, a retired veteran, is holding shares of TMT Limited which are currently trading at USD 100. The volatility of the share is 25 percent per year, and the expected return on the stock is 10 percent for the same period. What is the expected stock price in one year?

A. USD 110.517

B. USD 128.403

C. USD 102.532

D. USD 101.432

Q.986 Mike Finova is holding shares of TMT Limited which are currently trading at USD 100. The volatility of the share is 25 percent per year, and the expected return on the stock is 10 percent for the same period. What is the standard deviation of the stock in one year?

A. USD 787.68

B. USD 28.07

C. USD 14

D. USD 100

Q.988 The manager at American Derivatives Limited Hedge Fund proposes to use the Black-Scholes-Merton differential equation to understand the pricing of derivatives dependent on non-dividend paying stocks. Which of the following assumptions with respect to the Black-Scholes-Merton model must be made to get accurate results?
I. The short-selling of securities is not permitted
II. There are no riskless arbitrage opportunities
III. The risk-free rate of interest is known and constant
IV. Security trading is continuous

A. I, II & III only

B. I, III & IV only

C. II, III & IV only

D. All of the above

Q.989 With regard to the Black-Scholes-Merton Model, which of the following statements are true?
I. The Black-Scholes-Merton differential equation does not involve any variables that are affected by the risk preferences of investors
II. The current stock price, time, stock price volatility, and the risk-free rate of interest are involved
III. The Black-Scholes-Merton differential equation involves the expected return on the stock and, therefore, is dependent of risk preferences
IV. The Black-Scholes-Merton differential equation is an equation that must be satisfied by the price of any derivative dependent on a non-dividend paying stock

A. I, II & IV only

B. I, III & IV only

C. II & III only

D. All of the above

Q.990 Bret Lee, a research student, studying at McJohn University, analyzes academic material on regular options, employee stock options, and warrants. After analyzing the data, he prepares a brief to present to his professor. He jots down the following points in the brief:
Statement I: The exercise of a regular call option has no effect on the number of the company's shares outstanding
Statement II: The exercise of warrants leads to the company issuing more shares and selling them to the holder of the warrant at the strike price
Statement III: Exercise of warrants tend to dilute the interest of the existing shareholders as the strike price is usually less than the market price
Statement IV: Exercise of warrants and employee stock options does not have any effect on the number of company's shares outstanding

Which of these statements are accurate?

A. I, II & III only

B. I, III & IV only

C. II, III & IV only

D. All of the above

Q.992 Steyn Associates used implied volatilities in pricing securities instead of historical volatilities. With regard to volatilities, which of the following statement(s) is/are true?
I. Implied volatilities are the volatilities implied by option prices observed in the market
II. Historical volatilities are backward-looking, whereas implied volatilities are forward-looking
III. Traders often quote the implied volatility of an option rather than its price. This is convenient because the implied volatility tends to be less variable than the option price
IV. The implied volatilities of actively traded options are used by traders to estimate appropriate implied volatilities for other options

A. I, II & III only

B. I, III & IV only

C. II, III & IV only

D. All of the above

Q.993 Stephen Hawking, a trader working at Orange Securities, collects the following data of a 1-year European put and call options on the stock Mango Apparel. The current stock price is USD 120, and the strike price of the option is USD 125. The risk-free rate is 10 percent. If the prices of a European call and European put are USD 10 and USD 15, respectively, then what is the implied dividend yield of the stock Mango Apparel?

A. 0.11439

B. 0.045323

C. 0.10439

D. 0.055323

Q.994 Chinese International Bank is analyzing the stock of Jatoka International. One-year European call and put options are written on the stock of Jatoka International which is a non-dividend paying stock. The initial stock price is Yuan 100 and the risk-free rate is 5%. The time to maturity is 1 year, and the strike price is Yuan 125. Furthermore, $N(d_1) = 0.6925, N(d_2) = 0.5435$. What are the values of European put and call options (approx.) using the Black-Scholes differential equation?

A. Call option value is USD 4.626 and Put option value is USD 23.52.

B. Call option value is USD 23.52 and put option value is USD 4.626.

C. Call option value is USD 2.626 and Put option value is USD 13.52.

D. Call option value is USD 13.52 and put option value is USD 2.626.

Q.995 Raheja Financials is holding the stock of Duckworth Limited which is trading at USD 50. A European call option that expires in 3 months with a strike price of USD 51 is available for trading. The annualized standard deviation is 20 percent, and the risk-free rate of interest is 4 percent. What is the value of the European call option using the Black-Scholes-Merton model expiring in 3 months if $N(d_1) = 0.48085$ and $N(d_2) = 0.44116$?

A. USD 2.422

B. USD 2.224

C. USD 1.767

D. USD 1.259

Q.996 Michael Wong is holding the stock of Duckworth limited which is trading at USD 50. A European put option that expires in 3 months with a strike price of USD 51 is available for trading. The annualized standard deviation is 20 percent, and the continuously compounded risk-free rate is 4 percent. What is the value of the European put option using the Black-Scholes-Merton model expiring in 3 months if $N(d_1) = 0.48085$ and $N(d_2) = 0.44116$?

A. USD 1.77

B. USD 1.26

C. USD 2.19

D. USD 2.26

Q.3407 A stock price has an expected return of 10% and a volatility of 30%. The current price is $30. What is the probability that a European call option on the stock with an exercise price of $32 and a maturity date in six months will be exercised?

A. 0.5032

B. 0.247

C. 0.4305

D. 0.008

Q.3408 What is the price of a European call option on a non-dividend-paying stock when the stock price is $68, the strike price is $65, the risk-free interest rate is 16% per annum, the volatility is 39% per annum, and the time to maturity is three months?

A. 5.35

B. 4.85

C. 8.31

D. 0.536

Q.3409 Consider a European call option when the stock price is $20, the exercise price is $22, the time to maturity is six months, the volatility is 20% per annum, and the risk-free interest rate is 15% per annum. Two equal dividends of $1 are expected during the life of the option, with ex-dividend dates at the end of two months and five months. What is the value of the option?

A. $0.30

B. $0.40

C. $0.25

D. $0.26

Q.3410 Consider a European option on a non-dividend paying stock with the following characteristics:

- Current stock price = $50
- Exercise price = 50
- Continuous compounding interest rate = 8%
- Standard deviation = 34%
- Time to expiration = 2 years

Calculate the price of the call option and its delta using the Black-Scholes-Merton model.

A. Call = $12.97; Δ = 0.7167

B. Call = $5.57; Δ = 0.7167

C. Call = $5.57; Δ = -0.2832

D. Call = $12.97; Δ = -0.2832

Q.3411 Consider a European option on a non-dividend paying stock with the following characteristics:

- Current stock price = $50
- Exercise price = 50
- Continuous compounding interest rate = 8%
- Standard deviation = 34%
- Time to expiration = 2 years

Calculate the price of a put option and its delta using the Black-Scholes-Merton model.

A. Put = $12.97; Δ = 0.7167

B. Put = $5.57; Δ = 0.7167

C. Put = $5.57; Δ = -0.2832

D. Put = $12.97; Δ = -0.2832

Q.3412 Consider a company with N million shares outstanding, each worth So, that is contemplating issuing M warrants. Each warrant would grant the holder the right to purchase one share with a strike price of X in a year. Assuming the value of a corresponding 1-year European call option is worth C, the cost of issuing the warrants would take which of the following forms?

A. $\frac{C}{N+M}$

B. $\frac{MC}{N+M}$

C. $\frac{MNC}{N+M}$

D. $\frac{NC}{N+M}$

Q.3414 What is the effect of dividends on option prices?

A. Call option prices increase; Put option prices increase

B. Call option prices increase; Put option prices decrease

C. Call option prices decrease; Put option prices increase

D. Call option prices decrease; Put option prices decrease

Q.4618 A stock has an initial price of $50, an expected annual return of 20%, and annual volatility of 25%. What is the 95% confidence interval for the stock price at the end of 3 years?

A. $22.83< S_T <$301.27

B. $44.18< S_T <$57.33

C. $31.28< S_T <$57.08

D. $35.49< S_T <$193.77

Q.4619 Suppose the current exchange rate for a currency is 1.25, and the exchange rate volatility is 15%. Calculate the value of a call option to buy 1000 units of the currency in 5 years at an exchange rate of 2.50. The domestic and foreign risk-free interest rates are 1% and 2%, respectively.

A. 2.9

B. 3.8

C. 43.5

D. 1249.9

Q.4620 The futures price of an asset is USD 40, and the annual volatility of the futures price is 20%. If the risk-free rate is 5%, what is the value of a put option to sell futures in 6 months for USD 45?

A. USD 2.75

B. USD 5.52

C. USD 2.68

D. USD 4.82

Q.4621 The current price of a stock is USD 50. If this price grows to USD 74.59 in two years, what is the realized return on the stock per annum?

A. 0.2

B. 0.49

C. 0.34

D. 0.22

Q.4622 The following are monthly stock prices in EUR: 21, 35, 40, and 28. From this data, what is the estimated volatility of the log-returns per month?

A. 0.435

B. 0.189

C. 0.402

D. 0.355

Reading 60: Option Sensitivity Measures: The "Greeks"

Q.1186 Fintech Company Inc. is planning to purchase a call option on European Airlines. The continuous dividend yield is 2 percent and the time to maturity is 2 years. If the continuous risk-free rate is 5 percent and N(d1) is 0.45, what is the Delta of the call option?

A. 0.432

B. -0.432

C. 0.864

D. -0.864

Q.1187 John Augustus, an equity analyst at Fintech Inc., is evaluating a portfolio of American Airlines stock and options on the same stock. The portfolio is currently Delta neutral but has a positive Gamma. If Augustus would like to make the portfolio both Delta and Gamma neutral, then Johnson will:

A. Sell stock of American Airlines and sell Put options on stock of American Airlines.

B. Buy stock of American Airlines and buy Put options on stock of American Airlines.

C. Buy stock of American Airlines and sell Put options on stock of American Airlines.

D. Sell stock of American Airlines and buy Put options on stock of American Airlines.

Q.1188 Trenor Johnson, a portfolio manager, working at Sterile Finances Limited, is analyzing the delta of a portfolio. Which of the following statements is (are) true about the delta of a portfolio?

A. Call options have negative deltas while put options have positive Deltas.

B. Delta on options lie between -1 and +1.

C. The delta of the underlying asset is always zero.

D. All of the above.

Q.1189 Which of the following statements is/are true regarding theta?

I. Theta is a measure of the change in the value of the options portfolio with the passage of time
II. A positive theta implies that the portfolio will increase in value as time passes
III. Theta increases as the expiration date approaches for at-the-money options
IV. Theta increases as an option which is either out of the money or in the money approaches expiration

A. I & II

B. III & IV

C. I, III & IV

D. All the above

Q.1191 Which of the following statements is true with regard to Gamma?

I. Gamma of a portfolio of options on an underlying asset is the rate of change of the portfolio's Delta with respect to the price of the underlying asset
II. Gamma is the second partial derivative of the portfolio with respect to asset price
III. If Gamma is highly negative or highly positive, Delta is very sensitive to the price of the underlying asset
IV. When Gamma is positive, theta tends to be negative

A. I & II only

B. I, II & III only

C. II & III only

D. All the above

Q.1192 The Vega of the stock of Amazon is 5. If the volatility of the underlying asset increases by 1 percent, what changes will take place in the price of the call option and put option if the maturity and exercise prices of both options remain the same?

A. The price of the call option increases by 0.05 and the price of the put option increases by 0.05.

B. The price of the call option decreases by 0.05 and the price of the put option decreases by 0.05.

C. The price of the call option decreases by 0.05 and the price of the put option increases by 0.05.

D. The price of the call option increases by 0.05 and the price of the put option decreases by 0.05.

Q.1193 Which of the following statement is NOT true with regard to Vega?
I. The Vega of a derivative portfolio is the rate of change of the value of the portfolio with the change in the volatility of the underlying assets
II. The Vega of a long position is always negative
III. A position in the underlying asset has a Vega equal to zero
IV. At-the-money options have the greatest Vega

A. II and III only

B. III only

C. II only

D. I, II and IV only

Q.1194 Consider a call option on a non-dividend paying stock where the stock price is $95, the risk-free rate is 5%, the time to maturity is 40 weeks (= 0.7692 years) and $N' = 0.398185$. A 1% increase in the volatility will increase the value of the option by approximately:

A. -33.176

B. -0.33176

C. 33.176

D. 0.33176

Q.1195 Which of the following statement is true with regard to Rho?

A. The Rho of a portfolio of options is the rate of change of the value of the portfolio with respect to the interest rate.

B. The Rho of a portfolio of derivatives is the rate of change of the value of the portfolio with respect to the volatility of the underlying asset.

C. The Rho of a portfolio of options on an underlying asset is the rate of change of the portfolio's Delta.

D. The Rho of a portfolio of options is the rate of change of the value of the portfolio with respect to the passage of time with all else remaining the same.

Q.1196 A stock is currently trading at $25. The delta of the call option is 0.482. A fund manager buys 100,000 call options with a strike price of $26.50 on the stock. To maintain a delta neutral position, the fund manager must:

A. Buy 4,820,000 shares

B. Sell 4,820,000 shares

C. Buy 1,000,000 shares

D. Sell 1,000,000 shares

Q.1197 A stock is currently trading at $25. The delta of the call option is 0.482. A fund manager buys 100,000 call option contracts on the stock with a strike price of $29. What action is most likely to be taken by the fund manager to maintain a delta neutral position?

A. Sell 4,820,000 shares.

B. Buy 4,820,000 shares.

C. Buy 48,200 call options.

D. Sell 48,200 shares.

Q.1198 A portfolio manager buys 100 APR 45 call option selling for $3.58 that have a delta of 0.4 and a gamma of 0.1. If the underlying trades downwards by $1, then the delta of the overall position will now be:

A. 0.3

B. 30

C. 27

D. 0.27

Q.1199 A portfolio of derivatives on a stock has a delta of 2400 and a gamma of –100. Also available for trading is an option on the stock with a delta of 0.5 and a gamma of 0.04. To make the portfolio gamma neutral, the portfolio manager should:

A. Buy 2,500 options.

B. Sell 2.500 options.

C. Buy 1,200 options.

D. Sell 1,200 options.

Q.1200 A portfolio manager anticipates that the market volatility will increase substantially in the coming days. He observes two call options which are currently being traded in the market:

I. A call option on stock A, currently trading at $20 with a strike price of $30
II. A call option on stock B, currently trading at $40 with a strike price of $42

The portfolio manager wants to derive the maximum benefit from the anticipated market volatility. The preferred investment should be:

A. Go long on call options on Stock A.

B. Go long on call options on Stock B.

C. Go short on call options on Stock A.

D. Go short on call options on Stock B.

Q.1201 Stock A is currently trading at $40. A three-month futures contract on Stock A is currently trading at $40.60. Assume the risk-free rate to be 6%.
The delta of the futures contract is:

A. 1.02

B. 1.2

C. 1.12

D. 1.22

Q.1203 A fund manager sells 200,000 call options on stock A, a non-dividend paying stock. The delta of the stock option is 0.45, and the risk-free rate is 6%.
Select the most appropriate statement.

A. The position can be made delta and gamma neutral by buying 9,000,000 shares of the underlying asset.

B. The position can be made delta neutral by going short 90,000 shares on the underlying asset.

C. The position can be made delta neutral by buying 9,000,000 shares of the underlying asset.

D. The position can be made delta neutral by going short on call options.

Q.3415 Which one of the following statements is true regarding option Greeks?

A. Gamma is greatest for in-the-money options with long maturities

B. Delta of deep-in-the-money put options tends toward +1

C. Vega is greatest for at-the-money options with long maturities

D. When buying at-the-money options, theta tends to be positive

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Q.3417 A trader has a short option position that's delta-neutral but has a gamma of -800. In the market, there's a tradeable option with a delta of 0.8 and a gamma of 2. To maintain the position gamma-neutral and delta-neutral, the most appropriate strategy is to:

A. Sell 320 options and buy 400 shares of the underlying

B. Buy 400 options and sell 320 shares of the underlying

C. Buy 400 options and buy 320 shares of the underlying

D. Sell 320 options and buy 320 shares of the underlying
