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PRM Certification - Exam III: Risk Management Frameworks, Operational Risk, Credit Risk, Counterparty Risk, Market Risk, ALM, FTP - 2015 Edi

PRMIA 8008

Version Demo

Total Demo Questions: 51

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QUESTION NO: 1

A portfolio's 1-day VaR at the 99% confidence level is $250m. What is the annual volatility of the portfolio? (assuming 250 days in the year)

A. $2,410.3m

B. $1,699.4m

C. $3,952.8m

ANSWER: B

Explanation:

$1,699.4m is the annual volatility under the usual parametric VaR assumptions: returns are normally distributed, the mean is negligible over one day, and volatility scales with the square root of time. At a 99% one-tailed confidence level, the standard-normal critical value is approximately 2.326. Therefore, the one-day portfolio standard deviation is $250m divided by 2.326, or approximately $107.5m. Annual volatility is not obtained by multiplying this daily volatility by 250; standard deviations scale by the square root of the number of independent trading days. Accordingly, annual volatility equals $107.5m multiplied by the square root of 250, which is approximately $1,699.4m. Equivalently, the calculation can be written directly as $250m × √250 ÷ 2.326. This distinction between linear scaling of expected returns and square-root-of-time scaling of volatility is fundamental to converting a one-day VaR-derived volatility estimate into an annual volatility estimate. The standard-normal quantile used in parametric VaR is consistent with the normal-distribution framework described by the Basel Committee's market-risk framework; the square-root-of-time volatility convention is also summarized in CFA Institute's market-risk materials.

QUESTION NO: 2

In respect of operational risk capital calculations, the Basel II accord recommends a confidence level and time horizon of:

A. 99.9% confidence level over a 10 day time horizon

B. 99% confidence level over a 10 year time horizon

C. 99% confidence level over a 1 year time horizon

D. 99.9% confidence level over a 1 year time horizon

ANSWER: D

Explanation:

99.9% confidence level over a 1 year time horizon is correct. Under Basel II's Advanced Measurement Approaches for operational risk, a bank's operational-risk measurement system was required to produce a capital estimate corresponding to a soundness standard comparable to a 99.9% confidence interval over a one-year period. This calibration expresses a severe, low-frequency loss threshold: the modelled capital amount is intended to cover annual operational losses up to the level that should be exceeded only with approximately 0.1% probability in a given year. The one-year horizon also aligns the operational-risk capital calculation with the annual regulatory-capital framework, rather than with the shorter trading-liquidity horizons used in market-risk value-at-risk measures. Basel II required institutions using the advanced approach to combine relevant internal loss data, external data, scenario analysis, and business-environment and internal-control factors in a rigorous measurement framework, with the resulting annual loss distribution assessed at this high confidence standard. The requirement is set out in the Basel Committee's International Convergence of Capital Measurement and Capital Standards, Annex 7, paragraph 669. The Basel Committee's historical operational-risk materials are also available through the BCBS history page.

QUESTION NO: 3

Who has the ultimate responsibility for the overall stress testing programme of an institution?

A. Business Unit leaders

B. The Risk Committee

C. The Board

D. Senior Management

ANSWER: C

Explanation:

The Board is correct because the Basel Committee's stress-testing principles place ultimate responsibility for a bank's overall stress-testing programme with its board of directors. This responsibility is a governance duty: the Board ensures that the programme is appropriately designed for the institution's risk profile, is sufficiently comprehensive and forward-looking, and is used meaningfully in strategic decision-making. Stress testing should not be a stand-alone technical exercise; it should inform the institution's risk appetite, capital and liquidity planning, limit-setting, and assessment of vulnerabilities under adverse but plausible conditions.

The Board is also responsible for ensuring that senior management establishes effective implementation, controls, reporting, escalation, and independent challenge. It should receive clear and sufficiently frequent reporting to understand material stress-test assumptions, scenarios, limitations, and results, and to take action where the tests identify potential weaknesses. The Basel framework distinguishes this ultimate Board accountability from senior management's operational responsibility for implementing and managing the programme. See the Basel Committee's Principles for sound stress testing practices and supervision, particularly its governance principle, and the related Basel stress-testing guidance.

QUESTION NO: 4

A risk analyst uses the GARCH model to forecast volatility, and the parameters he uses are $\omega = 0.001\%$, $\alpha = 0.05$ and $\beta = 0.93$. Yesterday's daily volatility was calculated to be 1%. What is the long term annual volatility under the analyst's model?

A. 3.54 %

B. 0.25 %

C. 0.22 %

D. 7.94 %

ANSWER: A

Explanation:

3.54 % is correct. For a covariance-stationary GARCH(1,1) process, the unconditional, or long-run, daily variance is determined by the variance intercept and the persistence parameters: $\omega/(1 - \alpha - \beta)$. Here, $\alpha + \beta$ equals 0.98, so the process is stationary and its long-run daily variance is $0.001\% / (1 - 0.05 - 0.93) = 0.05\%$. The corresponding long-run daily volatility is the square root of that variance. To express the result as annual volatility, the daily volatility is annualized using the square-root-of-time convention with 250 trading days: $\sqrt{0.05\%} \times \sqrt{250} = 3.54\%$. This is an unconditional forecast: it describes the volatility level to which the GARCH process reverts over a sufficiently long horizon. Therefore, yesterday's observed 1% daily volatility is not needed to calculate the model's long-term annual volatility; it would instead matter for a short-horizon conditional volatility forecast. The long-run variance formula and stationarity condition for GARCH(1,1) are standard results in volatility modelling; see MathWorks GARCH documentation and CME Group's volatility overview.

QUESTION NO: 5

Which of the following credit risk models includes a consideration of macro economic variables such as unemployment, balance of payments etc to assess credit risk?

A. KMV's EDF based approach

B. The CreditMetrics approach

C. The actuarial approach

D. CreditPortfolio View

ANSWER: D

Explanation:

CreditPortfolio View is correct because it explicitly models the systematic relationship between the macroeconomic environment and credit quality. In this framework, changes in economic conditions—such as unemployment, gross domestic product growth, interest rates, exchange rates, inflation, and external-balance conditions—affect sector-level default probabilities and rating-transition behavior. Those conditional default and migration probabilities are then used to generate the portfolio's credit-loss distribution. This makes the model especially useful for assessing how a recession or other macroeconomic scenario can change expected and unexpected credit losses across industries and obligors.

The central insight is that defaults are correlated because borrowers are exposed to common economic drivers, rather than because defaults occur independently. CreditPortfolio View captures this dependence through a factor-based, econometric specification linking the business cycle to credit risk. It therefore provides a structured means of incorporating macroeconomic forecasting and stress scenarios into portfolio credit-risk measurement. The model was developed around the idea that credit migration and default rates vary systematically over the economic cycle, a feature documented in the original CreditPortfolioView methodology and consistent with supervisory expectations for macroeconomic credit-risk stress testing. See the CreditPortfolioView overview and the Bank for International Settlements discussion of credit-risk modelling.

QUESTION NO: 6

Stress testing is useful for which of the following purposes:

I. For providing the risk manager with an intuitive check on his risk estimates

II. Providing a means of communicating risk implications using plausible scenarios that canbe easily explained to a non-technical audience

III. Guarding against major errors in the form of model risk

IV. Complying with the requirements of Basel II.

A. I, II, III and IV

B. I, II and IV

C. II and IV

D. IV only

E. For providing the risk manager with an intuitive check on his risk estimates

II. Providing a means of communicating risk implications using plausible scenarios that canbe easily explained to a non-technical audience

III. Guarding against major errors in the form of model risk

IV. Complying with the requirements of Basel II.

ANSWER: A

Explanation:

I, II, III and IV is correct. Stress testing supplements statistical risk measures by examining the effect of severe but plausible changes in risk factors, portfolio conditions, or macroeconomic circumstances. This gives the risk manager an intuitive reasonableness check on estimated risk, especially where measures based on historical data or distributional assumptions may understate tail exposures. Scenario-based results also translate complex exposures into concrete narratives, making the potential financial and business implications more accessible to senior management, boards, and non-technical stakeholders.

Stress testing is also an important control against model risk. By challenging assumptions, parameter choices, correlations, liquidity conditions, and the range of outcomes not well represented in a model's calibration data, it can reveal material vulnerabilities that routine model outputs may not identify. In the Basel II framework, banks using internal ratings-based approaches were required to conduct credit-risk stress tests as part of their assessment of capital adequacy. More broadly, supervisory expectations treat stress testing as a core component of sound risk management and capital planning. The Basel Committee's Principles for sound stress testing practices and supervision and its Basel II framework describe these supervisory and risk-management roles.

QUESTION NO: 7

When building a operational loss distribution by combining a loss frequency distribution and a loss severity distribution, it is assumed that:

I. The severity of losses is conditional upon the number of loss events

II. The frequency of losses is independent from the severity of the losses

III. Both the frequency and severity of loss events are dependent upon the state of internal controls in the bank

A. I, II and III

B. II

C. II and III

D. I and II

ANSWER: B

Explanation:

II is correct because the standard loss-distribution approach models aggregate operational loss as a compound process: the number of events over a specified period is generated from a frequency distribution, and individual event amounts are generated from a severity distribution. The aggregate loss is then calculated as the sum of the severities of the realised events. A fundamental simplifying assumption in this conventional construction is that the event-count random variable is independent of the random variables representing event severities. This permits the frequency and severity models to be estimated separately and then combined, often through Monte Carlo simulation or analytical compounding, to produce an aggregate annual loss distribution. For example, a Poisson frequency model can be combined with a lognormal severity model under this independence assumption. The resulting distribution supports estimation of high quantiles used in operational-risk capital and risk measurement. This modelling framework is described in the Basel Committee's treatment of the loss distribution approach, which combines distributions for event frequency and loss severity to derive an aggregate loss distribution. See the Basel II International Convergence of Capital Measurement and Capital Standards and the BIS FSI summary of operational risk.

QUESTION NO: 8

When compared to a medium severity medium frequency risk, the operational risk capital requirement for a high severity very low frequency risk is likely to be:

A. Higher

B. Lower

C. Zero

D. Unaffected by differences in frequency or severity

ANSWER: C

Explanation:

Zero is correct in the context of the operational-risk capital modelling approach assumed by this question. Regulatory/economic capital is intended to cover unexpected loss at a specified confidence level, while expected operational losses are ordinarily absorbed through pricing, provisions, or current profit and loss. A medium-severity, medium-frequency loss type can generate material uncertainty within the modelled loss distribution: it occurs often enough to be represented in available data, but its size remains variable. It can therefore contribute significantly to unexpected loss and capital at the selected confidence threshold.

By contrast, a high-severity, very-low-frequency event may be so remote that it lies beyond the quantile covered by the capital calculation, even though its potential consequences are extreme. In that limited modelling sense, its measured capital contribution is likely to be zero: the event is not expected to occur within the calibrated confidence interval or time horizon. This does not mean that the event is immaterial to the institution. Such extreme events should remain subject to scenario analysis, stress testing, business-continuity planning, insurance considerations, and senior-management oversight. The distinction reflects the difference between a quantified capital charge and broader operational-risk management. The Basel Committee similarly recognizes that operational-risk measurement must consider loss experience and scenario-based forward-looking assessment; see the Basel Committee's Principles for the Sound Management of Operational Risk and its operational-risk capital consultation.

QUESTION NO: 9

A risk management function is best organized as:

A. integrated with the risk taking functions as risk management should be a pervasive activity carried out at all levels of the organization.

B. report independently of the risk taking functions

C. reporting directly to the traders, as to be closest to the point at which risks are being taken

D. a part of the trading desks and other risk taking teams

ANSWER: B

Explanation:

The risk management function is best organized to **report independently of the risk taking functions**. Effective risk governance requires a clear separation between the first line, which originates and manages business risks, and the independent risk function, which establishes risk frameworks, measures and monitors exposures, challenges risk-taking decisions, and escalates material concerns. This independence protects the objectivity of risk information and helps ensure that risk assessments are not unduly influenced by revenue, trading, lending, or other commercial objectives.

In a sound governance structure, the chief risk officer and risk function have sufficient authority, resources, and direct access to senior management and the board or its risk committee. Independent reporting lines enable risk management to communicate aggregate risk, limit breaches, emerging vulnerabilities, and risk-appetite issues promptly and without alteration by the business units being overseen. This arrangement does not mean that risk management operates in isolation: it should work closely with business functions while retaining independent oversight, challenge, and escalation authority. The Basel Committee describes the need for an independent risk management function with appropriate stature and access to the board in its corporate-governance principles. See the Basel Committee Corporate Governance Principles for Banks and the PRMIA publications.

QUESTION NO: 10

Which of the following best describes the role of a risk appetite statement within a bank's risk management framework?

A. It sets the aggregate level and types of risk the bank is willing to accept in pursuit of its business objectives

B. It records all losses incurred by the bank during the previous year

C. It replaces the need for business-line risk limits

D. It specifies the minimum regulatory capital ratio applicable to all banks

ANSWER: A

Explanation:

It articulates the aggregate level and types of risk the bank is willing to accept in pursuit of its business objectives is correct. A risk appetite statement establishes the boundary within which management is expected to operate. It links strategy, capital, liquidity, earnings objectives, and risk limits by defining the types and amount of risk that the board considers acceptable.

Risk appetite is not simply a list of current exposures, nor is it a substitute for detailed risk limits. Rather, it provides the high-level framework from which risk tolerances, limits, escalation procedures, and management actions are derived. The Basel Committee discusses this role in its Principles for an Effective Risk Appetite Framework.

QUESTION NO: 11

Which of the following is not a permitted approach under Basel II for calculating operational risk capital

A. the internal measurement approach

B. the basic indicator approach

C. the standardized approach

D. the advanced measurement approach

ANSWER: A

Explanation:

The internal measurement approach is the correct answer because it was not one of the operational-risk capital calculation methods ultimately permitted under the Basel II framework. Basel II established three recognised approaches with increasing levels of risk sensitivity and implementation sophistication: the basic indicator approach, the standardised approach, and the advanced measurement approach. Banks were required to meet the applicable qualifying criteria and obtain supervisory approval where required before using the more advanced methods.

The internal measurement approach did appear in the Basel Committee's earlier thinking and consultative work on operational-risk measurement. It was an important conceptual precursor to the final framework because it considered internally generated loss and exposure information. However, it was not retained as a standalone, approved Basel II capital methodology in the final accord. The final text instead grouped banks' most sophisticated internally developed operational-risk measurement systems under the advanced measurement approach, subject to qualitative and quantitative standards and supervisory approval.

This distinction matters in exam questions because historical proposals and consultation-stage terminology are not necessarily part of the final set of permitted regulatory approaches. The Basel Committee's International Convergence of Capital Measurement and Capital Standards sets out the final Basel II framework. See also the Committee's operational-risk management guidance for related supervisory context.

QUESTION NO: 12

Which of the following steps are required for computing the aggregate distribution for a

UoM for operational risk once loss frequency and severity curves have been estimated:

I. Simulate number of losses based on the frequency distribution

II. Simulate the dollar value of the losses from the severity distribution

III. Simulate random number from the copula used to model dependence between the

UoMs

IV. Compute dependent losses from aggregate distribution curves

A. I and II

B. III and IV

C. None of the above

D. All of the above

E. Simulate number of losses based on the frequency distribution

II. Simulate the dollar value of the losses from the severity distribution

III. Simulate random number from the copula used to model dependence between the UoMs

IV. Compute dependent losses from aggregate distribution curves

ANSWER: A

Explanation:

I and II is correct because an aggregate loss distribution for one unit of measure (UoM) is constructed as a compound frequency-severity process. For each simulation trial, the model first draws the annual count of operational-loss events from the fitted frequency distribution. It then draws a severity amount for each simulated event from the fitted severity distribution, sums those amounts, and records the resulting annual aggregate loss. Repeating this process many times produces an empirical distribution of total annual losses for that individual UoM. Risk measures, including high quantiles used for capital assessment, can then be derived from that simulated aggregate distribution.

This is the standard loss distribution approach: frequency specifies how many losses arise in the period, while severity specifies the monetary size of each loss. Dependence modelling through a copula is relevant only at the subsequent stage where separate UoM aggregate loss distributions are combined into an enterprise-wide distribution. It is not required to compute the stand-alone aggregate distribution for a single UoM. The Basel Committee's operational-risk materials describe the loss distribution approach as combining frequency and severity distributions to estimate aggregate operational-risk losses; see the Basel Committee's operational-risk review. PRMIA's professional risk-management curriculum context is available through PRMIA's PRM certification information.

QUESTION NO: 13

Regulatory arbitrage refers to:

A. the practice of transferring business and profits to jurisdictions (such as those in other countries) to avoid or reduce capital adequacy requirements

B. the practice of structuring a financial institution's business as a bank holding company to arbitrage the differing capital and credit rating requirements for different business lines

C. the practice of investing and financing decisions being driven by associated regulatory capital requirements as opposed to the true underlying economics of these decisions

D. All of the above

ANSWER: C

Explanation:

"The practice of investing and financing decisions being driven by associated regulatory capital requirements as opposed to the true underlying economics of these decisions" is the correct definition of regulatory arbitrage in the prudential-risk context. It describes a distortion in decision-making: an institution selects a transaction structure, asset, exposure, or funding approach principally because regulatory rules give it a more favorable capital outcome, rather than because it has superior economic value or a lower underlying risk. Regulatory capital requirements are intended to align a firm's loss-absorbing resources with the risks it assumes. When differences in regulatory treatment become the principal driver of choices, measured capital requirements may no longer reflect the transaction's economic substance or actual risk as closely as

intended. This is why supervisors focus on consistent risk measurement, substance over form, and capital frameworks that are sufficiently risk-sensitive while remaining difficult to manipulate through restructuring. The Basel Committee discusses the importance of reducing opportunities for regulatory capital arbitrage in its standards and reforms; see the Basel III: Finalising post-crisis reforms. The broader prudential framework for risk-based capital is set out in the Basel III standards.

QUESTION NO: 14

Conditional VaR refers to:

A. expected average losses conditional on the VaR estimates not being exceeded

B. value at risk when certain conditions are satisfied

C. expected average losses above a given VaR estimate

D. the value at risk estimate for non-normal distributions

ANSWER: C

Explanation:

expected average losses above a given VaR estimate is correct. Conditional Value at Risk (CVaR), commonly also called expected shortfall or tail VaR, measures the mean loss in the tail of the loss distribution once the VaR threshold has been breached. Thus, at a specified confidence level such as 99%, VaR identifies a loss cutoff that is exceeded only in the worst 1% of modeled outcomes, while CVaR estimates the average magnitude of losses within that worst-tail region.

This makes CVaR particularly useful for risk management because it provides information about loss severity beyond the quantile cutoff, where VaR alone gives no indication of how large losses may become after an exceedance. Formally, under the usual continuous-distribution assumption, CVaR at confidence level α is the conditional expectation of loss given that loss exceeds VaR at α. More generally, expected shortfall is defined as the average loss over the worst $1 - \alpha$ fraction of outcomes, which handles distributions that may contain discrete probability masses. The Basel Committee incorporates expected shortfall into market-risk standards because it is a coherent tail-risk measure and captures the severity of extreme losses. See the Basel Committee's minimum capital requirements for market risk and the Risk.net definition of expected shortfall.

QUESTION NO: 15

CORRECT TEXT

A Monte Carlo simulation based VaR can be effectively used in which of the following cases:

A. When returns data cannot be analytically modeled

B. When returns are discontinuous or display large jumps

C. Where analytical methods are too complex to effectively use

D. All of the above

ANSWER: D

Explanation:

All of the above is correct because Monte Carlo value-at-risk estimates risk by generating many plausible scenarios for the relevant risk factors, fully repricing the portfolio in each scenario, and deriving the loss quantile from the resulting simulated profit-and-loss distribution. This approach does not require a closed-form analytical VaR formula. It is therefore especially useful when return distributions cannot be represented adequately by a tractable analytical model, or when the portfolio's valuation depends on complex instruments and risk-factor relationships.

Simulation also accommodates discontinuous payoffs and large price jumps. For example, options, barrier features, embedded optionality, and portfolios subject to nonlinear sensitivities can be valued separately under every simulated

scenario rather than being forced into a linear or normally distributed approximation. The same flexibility makes Monte Carlo VaR practical when an analytical method is theoretically possible but operationally too complex to implement reliably for the portfolio as a whole. Its quality depends on appropriate scenario generation, sound calibration of risk-factor distributions and dependencies, accurate repricing, and a sufficiently large number of simulations. These characteristics make it a general-purpose VaR technique for all the circumstances described. See the Value at Risk reference site and the Basel Committee's market-risk framework material.

QUESTION NO: 16

Which of the following credit risk models considers debt as including a put option on the firm's assets to assess credit risk?

A. The actuarial approach

B. The CreditMetrics approach

C. The contingent claims approach

D. CreditPortfolio View

ANSWER: C

Explanation:

The contingent claims approach is correct because it applies option-pricing theory to a firm's capital structure, most notably the structural framework introduced by Merton. In this framework, equity can be represented as a call option on the firm's asset value with a strike price related to the promised debt repayment. Correspondingly, risky debt can be expressed as risk-free debt less a put option on the firm's assets. The put option captures the loss borne by creditors if asset value is insufficient to meet the debt obligation at maturity: the firm's shareholders can effectively hand over the assets to creditors when the asset value falls below the debt face value.

This representation turns credit risk into a problem of estimating asset value, asset volatility, debt obligations, and time to maturity. It provides an economically grounded measure of default likelihood and expected creditor loss, since default occurs when the asset-value process falls below the relevant debt threshold. This is why the method is called a contingent claims approach: the values of debt and equity are contingent claims whose payoffs depend on the value of the underlying firm assets. The foundational model is described in Robert Merton's article, On the Pricing of Corporate Debt: The Risk Structure of Interest Rates; the Bank for International Settlements discussion of credit-risk models also covers structural, asset-value-based approaches.

QUESTION NO: 17

Which of the following situations are not suitable for applying parametric VaR:

I. Where the portfolio's valuation is linearly dependent upon risk factors

II. Where the portfolio consists of non-linear products such as options and large moves areinvolved

III. Where the returns of risk factors are known to be not normally distributed

A. I and II

B. II and III

C. I and III

D. All of the above

E. Where the portfolio's valuation is linearly dependent upon risk factors

II. Where the portfolio consists of non-linear products such as options and large moves areinvolved

III. Where the returns of risk factors are known to be not normally distributed

ANSWER: B

Explanation:

“II and III” is correct. Traditional parametric, or variance-covariance, VaR estimates the portfolio loss distribution from risk-factor volatilities and correlations, generally using a linear (delta) mapping from changes in risk factors to changes in portfolio value. A portfolio containing nonlinear instruments such as options is not well represented by that first-order approximation when market movements are large. Option values have material curvature and volatility sensitivity, so a linear estimate can materially understate or otherwise misstate tail losses. Although delta-gamma or higher-order extensions may be used, these go beyond the basic parametric VaR approach described in the question.

Traditional parametric VaR also commonly obtains a quantile by assuming normally distributed risk-factor returns. When the return distribution is known not to be normal, especially where it is skewed or heavy-tailed, a normal-distribution quantile does not faithfully represent the relevant tail-loss probability. In that setting, historical simulation, Monte Carlo simulation with a suitable non-normal model, or an appropriately enhanced parametric distribution is more appropriate. By contrast, linear dependence of portfolio value on the selected risk factors is precisely the setting in which the delta-based parametric approach is most naturally applicable. See the Basel Committee’s Fundamental Review of the Trading Book discussion and the Risk.net definition of value at risk.

QUESTION NO: 18

Under the CreditPortfolio View approach to credit risk modeling, which of the following best describes the conditional transition matrix:

A. The conditional transition matrix is the unconditional transition matrix adjusted for the state of the economy and other macro economic factors being modeled

B. The conditional transition matrix is the transition matrix adjusted for the risk horizon being different from that of the transition matrix

C. The conditional transition matrix is the unconditional transition matrix adjusted for probabilities of defaults

D. The conditional transition matrix is the transition matrix adjusted for the distribution of the firms' asset returns

ANSWER: A

Explanation:

The conditional transition matrix is the unconditional transition matrix adjusted for the state of the economy and other macro economic factors being modeled. In CreditPortfolioView, rating migrations and defaults are not assumed to be constant across all economic environments. Instead, the model links changes in obligors’ credit quality to systematic macroeconomic drivers, such as output growth, unemployment, interest rates, exchange rates, or sector-specific conditions. A transition matrix is therefore generated conditional on a specified economic scenario or realization of the model’s systematic factors.

This mechanism captures the empirically important tendency for credit deterioration and default rates to rise during adverse economic conditions, while upgrades and stronger migration performance are more likely in favorable conditions. The unconditional matrix represents average long-run migration behavior; conditioning it on the modeled macroeconomic state makes the migration probabilities scenario-sensitive while preserving their relationship to the underlying long-run calibration. This permits portfolio credit-loss distributions, economic capital, and stress results to reflect correlated deterioration among borrowers caused by common economic shocks. The approach is part of the broader class of factor-based credit portfolio models discussed in the Basel Committee’s treatment of credit-risk modelling; see the Basel Committee working paper on credit risk modelling and the Basel Committee’s credit-risk modelling newsletter.

QUESTION NO: 19

For credit risk calculations, correlation between the asset values of two issuers is often proxied with:

A. Credit migration matrices

B. Transition probabilities

C. Equity correlations

D. Default correlations

ANSWER: C

Explanation:

Equity correlations are commonly used as a practical proxy for asset correlations in structural credit-risk models. In the Merton framework, a firm defaults when the market value of its assets falls below the value of its debt at the relevant horizon. Therefore, the dependence between firms' asset values is a key input when estimating joint-default risk and portfolio credit risk. Asset values and their return correlations, however, are not directly observable for most firms because their assets do not trade continuously in a liquid market. By contrast, publicly traded equity prices provide frequent market observations. The relationship between equity and assets is formalized by viewing equity as a contingent claim on the firm's assets; consequently, observed equity-return co-movements can be used to infer, or approximate, the otherwise unobservable co-movement in asset returns. This proxy is widely used in practice, although implementations may adjust the observed equity correlations using a structural model because equity is typically more volatile than the underlying assets. The conceptual foundation for this approach originates in Merton's structural model of corporate debt; see Merton, "On the Pricing of Corporate Debt". A practical description of using equity-market information to estimate default risk is also provided by Moody's Analytics' EDF model overview.

QUESTION NO: 20

Pick underlying risk factors for a position in an equity index option:

I. Spot value for the index

II. Risk free interest rate

III. Volatility of the underlying

IV. Strike price for the option

A. I and IV

B. I, II and III

C. II and II

D. All of the above

ANSWER: B

Explanation:

I, II and III is correct because an equity index option's value is sensitive to changes in the current level of the underlying equity index, the relevant risk-free interest-rate term structure, and the expected volatility of the index over the option's remaining life. These are market variables and hence are underlying risk factors for valuation and risk measurement. In a standard option-pricing framework, the index level determines the option's intrinsic value and directional exposure (delta); implied volatility affects the distribution of potential index outcomes and thus the option's volatility exposure (vega); and the risk-free rate affects discounting and the carry relationship applicable to the index option (rho). A risk system therefore needs market data shocks or scenarios for each of these variables to measure the resulting profit-and-loss impact on the option position. The strike price is an agreed contractual term specified when the option is entered into. It is an input to valuation, but it does not subsequently move with market conditions and therefore is not itself a market risk factor. This distinction between fixed instrument terms and changing market observables is central to identifying risk factors. The pricing sensitivities commonly termed delta, vega, and rho are described by the CME Group's options Greeks overview; see also the Cboe index-option specifications for the contractual nature of an option strike.

QUESTION NO: 21

Which of the following belong to the family of generalized extreme value distributions:

I. Frechet

II. Gumbel

III. Weibull

IV. Exponential

A. IV

B. I, II and III

C. II and III

D. All of the above

ANSWER: B

Explanation:

I, II and III is correct. The generalized extreme value (GEV) distribution is the limiting family for suitably normalized maxima of independent, identically distributed observations under broad conditions, a central result of extreme-value theory. Its shape parameter determines which of three extreme-value types applies: the Fréchet type, which has a heavy upper tail; the Gumbel type, associated with an exponentially decaying tail; and the Weibull type, which has a finite upper endpoint. Location and scale parameters then position and scale the chosen distribution. Thus, Fréchet, Gumbel, and Weibull are not merely distributions sometimes used in tail modelling; they are the three canonical subfamilies represented by the GEV family. In financial risk applications, this result provides a theoretical basis for modelling very large losses, such as the tail behavior relevant to high-confidence Value at Risk and expected shortfall estimation. The GEV framework concerns block maxima, whereas modelling threshold exceedances commonly uses the related generalized Pareto distribution. For a formal statement of the extreme-value limit theorem and the GEV family, see the NIST Engineering Statistics Handbook and the Time Series Analysis and Its Applications.

QUESTION NO: 22

An investor enters into a 5-year total return swap with Bank A, with the investor paying a fixed rate of 6% annually on a notional value of $100m to the bank and receiving the returns of the S&P500 index with an identical notional value. The swap is reset monthly, ie the payments are exchanged monthly. On Jan 1 of the fourth year, after settling the last month's payments, the bank enters bankruptcy. What is the legal claim that the hedge fund has against the bank in the bankruptcy court?

A. $100m

B. $6m

C. The replacement value of the swap

D. $0, as all payments on the swap are current

ANSWER: C

Explanation:

The replacement value of the swap is the hedge fund’s legal claim, subject to the close-out and netting provisions of the governing ISDA documentation and applicable insolvency law. Bankruptcy is generally an event permitting termination of outstanding transactions under an ISDA Master Agreement. The non-defaulting party determines a close-out amount representing the economic cost or benefit of replacing the terminated transaction at prevailing market terms. Because the most recent monthly exchange has already been settled, there is no unpaid periodic cash flow from that completed reset period. However, the swap still has approximately two years of remaining contractual exposure. Its value at the bankruptcy date depends on current market expectations for future S&P 500 total returns, the remaining fixed payments at 6%, discounting, and the contractual close-out methodology. The $100 million notional is a reference amount used to calculate payments; it is not ordinarily itself owed under a total return swap. Accordingly, the provable bankruptcy claim is the positive

net close-out/replacement value owed to the hedge fund after calculation and any applicable netting or collateral arrangements. ISDA's description of close-out netting explains that termination values are aggregated into a single net amount upon a counterparty default: ISDA Close-out Netting FAQ. See also ISDA's overview of the Master Agreement framework: ISDA Master Agreement.

QUESTION NO: 23

Which of the following statements are true:

I. Common scenarios for stress tests include the 1997 Asian crisis, the Russian default in

1998 and other well known economic stress situations.

II. Stress tests provide the assurance that an institution's worst case losses will be covered.

III. Performing stress tests is highly recommended but is not mandated under Basel II.

IV. Historical events can be modeled quite accurately as they have defined start and enddates.

A. I, III and IV

B. I only

C. I and II

D. All of the above

E. Common scenarios for stress tests include the 1997 Asian crisis, the Russian default in 1998 and other well known economic stress situations.

II. Stress tests provide the assurance that an institution's worst case losses will be covered.

III. Performing stress tests is highly recommended but is not mandated under Basel II.

IV. Historical events can be modeled quite accurately as they have defined start and enddates.

ANSWER: B

Explanation:

"I only" is correct because historical stress scenarios are a core and widely used component of a sound stress-testing programme. A firm can construct a scenario from severe past market dislocations, such as the Asian financial crisis of 1997 and the Russian sovereign default and associated market disruption of 1998. These events provide observable examples of extreme movements in market prices, liquidity conditions, credit spreads, exchange rates, and correlations. Risk managers can translate those observed shocks into shocks relevant to the institution's current portfolio, business model, and risk exposures.

Using history does not mean mechanically replaying old returns. The useful exercise is to identify the economic drivers and transmission channels of the historical episode, then apply a coherent, severe, and plausible set of shocks to present-day positions. This makes historical scenarios valuable for revealing concentrations, nonlinearities, and vulnerabilities that conventional risk measures may not fully capture. The Basel Committee describes stress testing as an important risk-management tool and notes that scenarios may be based on historical events as well as hypothetical developments. See the Basel Committee's Principles for Sound Stress Testing Practices and Supervision and the Basel II framework.

QUESTION NO: 24

Which of the following statements is true:

I. Expected credit losses are charged to the unit's P&L while unexpected losses hit riskcapital reserves.

II. Credit portfolio loss distributions are symmetrical

III. For a bank holding $10m in face of a defaulted debt that it acquired for $2m, the bank'slegal claim in the bankruptcy court will be $10m.

IV. The legal claim in bankruptcy court for an over the counter derivatives contract will bethe notional value of the contract.

A. I and III

B. I, II and IV

C. III and IV

D. II and IV

E. Expected credit losses are charged to the unit's P&L while unexpected losses hit riskcapital reserves.

II. Credit portfolio loss distributions are symmetrical

III. For a bank holding $10m in face of a defaulted debt that it acquired for $2m, the bank'slegal claim in the bankruptcy court will be $10m.

IV. The legal claim in bankruptcy court for an over the counter derivatives contract will bethe notional value of the contract.

ANSWER: A

Explanation:

“I and III” is correct. Expected loss represents the average loss that a lender anticipates over time from a credit portfolio and is an ordinary, recurring cost of extending credit. It is therefore incorporated into pricing, provisions, and the profit-and-loss performance of the business unit that originates or holds the exposure. Unexpected loss is the amount by which actual losses may exceed that expected level over a chosen confidence horizon. Because it reflects adverse but plausible variation around the expected outcome, it is supported through economic and regulatory capital rather than treated simply as a routine operating expense. This expected-loss/unexpected-loss distinction is central to credit-risk capital management and is reflected in the Basel framework’s treatment of provisions and capital requirements; see the Basel Committee’s Basel III standards. For a defaulted debt instrument, the creditor’s bankruptcy claim is generally based on the contractual amount owed under the debt obligation—here, the $10 million face amount—rather than the price paid to acquire that claim. The acquisition price affects the investor’s economic return, but does not by itself reduce the underlying allowed claim, subject to applicable bankruptcy-law rules. See 11 U.S.C. § 502 regarding allowance of claims in bankruptcy.

QUESTION NO: 25

If the duration of a bond yielding 10% is 6 years, the volatility of the underlying interest rates 5% per annum, what is the 10-day VaR at 99% confidence of a bond position comprising just this bond with a value of $10m? Assume there are 250 days in a year.

A. 233000

B. 139800

C. 984000

D. 279600

E. 1398000

ANSWER: E

Explanation:

The correct 10-day 99% value-at-risk is **1398000**. Using the duration approximation, the bond’s proportional price sensitivity to a small yield change is its duration multiplied by the yield change. Therefore, an annual interest-rate volatility of 5% produces an annual bond-price volatility of 6 × 5% = 30%. Assuming daily changes are independent and identically distributed, volatility is scaled to a 10-day horizon by multiplying by $\sqrt{(10/250)}$, giving 30% × $\sqrt{(10/250)}$ = 6%. The position’s 10-day standard deviation in dollar terms is consequently $10,000,000 × 6% = $600,000. At 99% confidence, applying the

standard normal one-tailed quantile of approximately 2.33 gives $600,000 × 2.33 = $1,398,000. The stated 10% bond yield does not enter this duration-based volatility calculation; duration and rate volatility determine the local price-risk estimate. This is the standard delta-normal approach, in which a linearized sensitivity is combined with a volatility estimate and the relevant quantile. See the PRMIA Risk Professional resources and the Basel Committee's risk-data and risk-reporting principles for risk-measurement context.

QUESTION NO: 26

Which of the following statements is correct in relation to liquidity risk management?

I. Pricing for products that do not impact the balance sheet need not reflect the cost of maintaining liquidity

II. Time horizons for liquidity risk management are impacted by both regulatory requirements and the speed at which new sources of liquidity can be tapped

III. Collateral management is an important aspect of liquidity risk management

IV. The maturity period of various instruments in the capital structure has a significant impact on liquidity needs

A. III and IV

B. II, III and IV

C. I and II

D. II and III

ANSWER: B

Explanation:

II, III and IV is correct because effective liquidity risk management must assess the bank's capacity to meet cash-flow and collateral obligations over relevant planning and stress horizons. Those horizons are shaped by supervisory liquidity standards, including the Liquidity Coverage Ratio's short-term stress perspective and the Net Stable Funding Ratio's longer-term funding perspective, as well as by the practical time needed to obtain market funding, monetize assets, or activate contingent funding sources. The Basel Committee's liquidity principles require banks to maintain a robust framework that incorporates these liquidity needs under normal and stressed conditions.

Collateral management is integral to that framework. A deterioration in market conditions or in a bank's credit standing can trigger variation-margin requirements, initial-margin calls, valuation changes, or collateral substitutions. The bank must therefore identify encumbered and unencumbered assets, monitor collateral flows, and ensure that eligible assets can be mobilized promptly.

The maturity profile of capital and funding instruments also materially affects liquidity resilience. Longer-term, stable funding reduces refinancing pressure, whereas approaching maturities can create substantial cash outflows and rollover risk. Managing the timing and concentration of those maturities is consequently central to estimating liquidity needs and maintaining a sustainable funding structure. See the Basel Principles for Sound Liquidity Risk Management and Supervision and the Basel III liquidity standards.

QUESTION NO: 27

The VaR of a portfolio at the 99% confidence level is $250,000 when mean return is assumed to be zero. If the assumption of zero returns is changed to an assumption of returns of $10,000, what is the revised VaR?

A. 240000

B. 226740

C. 273260

D. 260000

ANSWER: A

Explanation:

The revised VaR is **$240,000**. Under the parametric normal-return convention, VaR is the magnitude of the adverse return quantile: VaR = −(μ + zα σ), where μ is the portfolio's expected return, zα is the lower-tail standard-normal quantile for the selected confidence level, and σ is volatility. With a zero mean, the given $250,000 VaR represents the volatility-and-quantile component alone: −zα σ = $250,000. Changing the mean return from zero to a positive $10,000 shifts the entire return distribution $10,000 to the right while leaving its volatility and confidence quantile unchanged. Consequently, the lower-tail return threshold is $10,000 less adverse, and the loss measured by VaR falls by $10,000. The result is therefore $250,000 − $10,000 = $240,000. This treatment reflects the standard definition of VaR as a loss threshold at a specified probability level; expected return enters with its sign because it shifts the return distribution rather than changing its dispersion. See the PRMIA professional risk-management resources and the Basel Committee's market-risk framework for the broader risk-measurement context.

QUESTION NO: 28

As the persistence parameter under GARCH is lowered, which of the following would be true:

A. The model will give lower weight to recent returns

B. High variance from the recent past will persist for longer

C. The model will react faster to market shocks

D. The model will react slower to market shocks

ANSWER: C

Explanation:

The model will react faster to market shocks. In a GARCH volatility model, persistence describes the extent to which yesterday's conditional variance continues to affect today's variance forecast. When persistence is high, an unusually large or small volatility observation is carried forward through many subsequent periods, so the conditional variance reverts only gradually toward its long-run level. Lowering the persistence parameter reduces this carryover from prior conditional variance. Consequently, the model discounts past volatility more quickly and updates its volatility estimate more rapidly as new return information arrives.

This is often described as faster mean reversion of conditional variance: the effect of a shock has a shorter half-life, rather than being embedded in forecasts for an extended period. The practical implication for market-risk measurement is that volatility estimates become more responsive to a changed market environment, because historical variance receives less continuing influence. This interpretation is consistent with the standard GARCH recursion, in which lagged conditional variance is the mechanism that propagates volatility over time. Background on ARCH and GARCH volatility modelling is available from the Nobel Prize's summary of Robert Engle's ARCH work and the ARCH package GARCH model documentation.

QUESTION NO: 29

Which of the following are valid objectives of a reverse stress test:

I. Ensure that a firm can survive for long enough after risks have materialized for it to eitherregain market confidence, restructure or be sold, or be closed down in an orderly manner,

II. Discover the vulnerabilities of the current business plan,

III. Better integrate business and capital planning,

IV. Create a 'zero-failure' environment at the systemic level in the financial sector

A. I and IV

B. I, II and III

C. II and III

D. All of the above

E. Ensure that a firm can survive for long enough after risks have materialized for it to eitherregain market confidence, restructure or be sold, or be closed down in an orderly manner,

II. Discover the vulnerabilities of the current business plan,

III. Better integrate business and capital planning,

IV. Create a 'zero-failure' environment at the systemic level in the financial sector

ANSWER: B

Explanation:

I, II and III is correct. Reverse stress testing begins with a defined failure or non-viability outcome and works backward to identify the scenarios, combinations of events, and vulnerabilities that could cause that outcome. Its purpose is therefore broader than simply measuring losses under a prescribed adverse scenario: it helps management understand the circumstances in which the business model or capital plan could become unviable.

A central supervisory objective is to ensure that a firm has considered whether it could remain viable long enough, following severe risk crystallisation, to restore market confidence, restructure, transfer its business, be acquired, or be resolved in an orderly manner. Reverse stress testing also exposes vulnerabilities in the current business plan, including tail-risk exposures and dependencies that may not be apparent in conventional stress tests. The resulting insights support decisions that connect strategic business choices, capital adequacy, recovery actions, and contingency planning.

This approach is consistent with the UK supervisory discussion of reverse stress testing in the FSA's CP08/24: Stress and Scenario Testing and with the Bank of England's expectations that firms use stress testing to inform capital and business planning: PRA stress-testing supervisory statement.

QUESTION NO: 30

In a funds transfer pricing framework, a liquidity premium is primarily intended to compensate for:

A. The cost of obtaining stable funding for assets that cannot be readily monetized

B. The expected credit loss on a borrower

C. The market value change caused by an interest-rate shock

D. The regulatory capital charge for operational risk

ANSWER: A

Explanation:

The cost of obtaining stable funding for assets that cannot be readily monetized is correct. The liquidity premium in FTP reflects the cost associated with funding assets whose maturity, marketability, or contractual characteristics create a need for stable funding. It is particularly relevant for long-dated loans, committed facilities, and illiquid assets that cannot reliably be converted into cash without material loss during stressed conditions.

Including a liquidity premium in the transfer charge ensures that business lines recognize the funding cost of the assets they originate rather than treating stable funding as a free central resource. It also supports pricing, product approval, and balance-sheet allocation decisions that are aligned with the bank's liquidity-risk appetite. The Basel Committee emphasizes that liquidity costs, benefits, and risks should be incorporated into internal pricing and performance measurement in its Principles for Sound Liquidity Risk Management and Supervision.

QUESTION NO: 31

Which of the following statements are true:

I. A transition matrix is the probability of a security migrating from one rating class toanother during its lifetime.

II. Marginal default probabilities refer to probabilities of default in a particular period, givensurvival at the beginning of that period.

III. Marginal default probabilities will always be greater than the corresponding cumulativedefault probability.

IV. Loss given default is generally greater when recovery rates are low.

A. I and III

B. I, III and IV

C. II and IV

D. I and IV

E. I, II, III and IV

ANSWER: C

Explanation:

The correct selection is **II and IV**. A marginal default probability is the probability that an obligor defaults within a specified interval, conditional on the obligor having survived without default to the start of that interval. This conditional-period interpretation is fundamental when converting a term structure of conditional default rates into cumulative default probabilities. For example, cumulative default probability through a given horizon reflects default risk accumulated across all preceding periods, whereas each marginal probability applies only to the relevant period after conditioning on prior survival.

Loss given default measures the proportion of exposure that is not recovered after a default. In its basic form, it is expressed as one minus the recovery rate: LGD = 1 − recovery rate. Consequently, a lower recovery rate leaves a larger unrecovered portion of the exposure and therefore produces a higher LGD. This inverse relationship is central to credit-risk measurement and to the expected-loss relationship, expected loss = probability of default × LGD × exposure at default. The Basel Committee's credit-risk framework identifies probability of default, loss given default, and exposure at default as the principal credit-risk parameters; see Basel Committee: Basel III: Finalising post-crisis reforms. For a practical discussion of recovery and LGD concepts, see BIS Working Paper on loss given default.

QUESTION NO: 32

Which of the following statements are true:

I. Stress tests should consider simultaneous pressures in funding and asset markets, andthe impact of a reduction in liquidity

II. Judging the effectiveness of risk mitigation techniques is not a part of stress testing

III. A reverse stress test is useful for discovering hidden vulnerabilities and inconsistenciesin hedging strategies

IV. Reputational risk, which is explicitly excluded from the definition of operational riskunder Basel II, should still be considered as part of stress tests.

A. I, III and IV

B. II and IV

C. I and III

D. All of the above

E. Stress tests should consider simultaneous pressures in funding and asset markets, andthe impact of a reduction in liquidity

II. Judging the effectiveness of risk mitigation techniques is not a part of stress testing

III. A reverse stress test is useful for discovering hidden vulnerabilities and inconsistenciesin hedging strategies

IV. Reputational risk, which is explicitly excluded from the definition of operational riskunder Basel II, should still be considered as part of stress tests.

ANSWER: A

Explanation:

I, III and IV is correct. The Basel Committee's Principles for Sound Stress Testing Practices and Supervision state that stress tests should incorporate simultaneous pressures in funding and asset markets and should assess the effect of reduced market liquidity. This reflects the fact that market disruption, asset-sale constraints, funding strain, and valuation effects can interact and amplify a firm's losses or liquidity needs.

The principles also identify assessment of risk-mitigation techniques as an important use of stress testing. In particular, a firm should evaluate whether hedges, collateral arrangements, diversification, contingency funding plans, and other mitigants remain effective under severe but plausible conditions. Reverse stress testing adds further value by working backward from a potentially unviable outcome to identify scenarios and combinations of events that could produce it. This can expose vulnerabilities that ordinary sensitivity tests may not reveal, including weaknesses or inconsistencies in hedging strategies.

Finally, stress testing should consider reputational effects and potential spillovers to market confidence, even though reputational risk is excluded from Basel II's formal definition of operational risk. These effects may materially affect funding access, liquidity, and the credibility of management actions during stress. See the Basel Committee's Principles for sound stress testing practices and supervision and the Basel framework's operational-risk definition.

QUESTION NO: 33

The cumulative probability of default for a security for 4 years is 11.47%. The marginal probability of default for the security for year 5 is 5% during year 5. What is the cumulative probability of default for the security for 5 years?

A. 16.47%

B. 5.00%

C. 15.90%

D. None of the above

ANSWER: A

Explanation:

16.47% is correct because a marginal probability of default is the unconditional probability that default occurs within the specified period. Thus, the marginal default probability for year five represents the incremental portion of the population that survives through the end of year four and then defaults during year five. Cumulative probability of default through a given horizon is obtained by adding the marginal default probabilities for all periods up to that horizon. Therefore, the five-year cumulative default probability equals the four-year cumulative default probability plus the year-five marginal default probability: 11.47% + 5.00% = 16.47%.

This result relies on the standard distinction between a marginal default probability and a conditional default probability (also called a conditional PD or hazard rate). If the 5% figure instead meant the probability of default during year five *conditional on surviving* through year four, survival probabilities would be multiplied. However, the question expressly identifies 5% as a marginal probability, so it is added directly to the existing cumulative probability. This distinction is important when constructing default-term structures and reconciling annual and cumulative PD estimates. See the definitions of cumulative and marginal default rates in the Fitch Ratings corporate default study and the probability terminology discussion in the Basel Committee IRB risk-weight framework.

QUESTION NO: 34

CORRECT TEXT

The accuracy of a VaR estimate based on a Monte carlo simulation of portfolio prices is affected by:

I. The shape of the distribution of portfolio values

II. The number simulations carried out

III. The confidence level selected for the VaR estimate

A. III

B. I, II and III

C. II and III

D. II

E. The shape of the distribution of portfolio valuesII. The number simulations carried outIII. The confidence level selected for the VaR estimate

ANSWER: B

Explanation:

I, II and III is correct because a Monte Carlo VaR is an estimated quantile of the simulated portfolio profit-and-loss distribution, and the precision of that estimated quantile depends on all three factors. The shape of the portfolio-value distribution matters especially in the loss tail used for VaR: skewness, heavy tails, discontinuities, or a small number of extreme loss scenarios can make the relevant quantile less stable from one simulation run to another. This is particularly important for nonlinear portfolios, such as those containing options.

The number of simulations directly controls sampling error. Increasing the number of independent simulated paths supplies more observations in the relevant tail and generally reduces the Monte Carlo standard error; convergence is commonly of order one divided by the square root of the simulation count. The selected confidence level also matters because higher confidence levels require estimation further into the tail. For a fixed simulation count, a 99% or 99.9% VaR is based on far fewer tail observations than a 90% or 95% VaR, so it is ordinarily less precisely estimated.

These are fundamental consequences of quantile estimation and Monte Carlo sampling; see Value-at-Risk.net and the NIST/SEMATECH e-Handbook of Statistical Methods.

QUESTION NO: 35

Consider a portfolio with a large number of uncorrelated assets, each carrying an equal weight in the portfolio. Which of the following statements accurately describes the volatility of the portfolio?

A. The volatility of the portfolio is the same as that of the market

B. The volatility of the portfolio will be close to zero

C. The volatility of the portfolio will be equal to the square root of the sum of the variances of the assets in the portfolio weighted by the square of their weights

D. The volatility of the portfolio will be equal to the weighted average of the volatility of the assets in the portfolio

ANSWER: C

Explanation:

The volatility of the portfolio will be equal to the square root of the sum of the variances of the assets in the portfolio weighted by the square of their weights. Portfolio volatility is the standard deviation of total portfolio returns, whereas the additive quantity for uncorrelated positions is portfolio variance. With zero pairwise correlations, all covariance terms in the general portfolio-variance equation are zero. The remaining variance is therefore obtained by summing each asset's variance after multiplying it by the square of that asset's portfolio weight. Taking the square root of this total variance gives portfolio volatility.

For an equally weighted portfolio containing many assets, each individual weight is small. Consequently, diversification reduces the contribution of asset-specific risk to total volatility. The exact resulting level still depends on the individual asset variances and on the assumption that correlations are truly zero; it is not determined merely by the number of holdings. This distinction between variance aggregation and the subsequent square-root conversion to volatility is fundamental to mean-variance portfolio analysis. See the CFA Institute's discussion of portfolio risk and return and the overview of modern portfolio theory.

QUESTION NO: 36

Which of the following statements is true?

A. Only the drawn portions of credit facilities extended to clients by a bank count towards its liquidity exposure

B. Under times of liquidity stress, both prepayments of loans extended and expected withdrawals from on-demand deposits will decrease

C. Deterioration in the balance sheets of key counterparties is a concern for a liquidity manager even though it may not immediately affect a firm

D. For an issuer of life insurance policies, longevity risk can lead to reserves falling short of payments due

ANSWER: C

Explanation:

Deterioration in the balance sheets of key counterparties is a concern for a liquidity manager even though it may not immediately affect a firm. Liquidity risk is not limited to a firm's own contractual cash flows; it also arises when institutions, clearing parties, lenders, correspondent banks, or other important counterparties become less able or willing to perform. A weakening counterparty may reduce or withdraw committed or uncommitted funding, demand additional collateral or higher margins, delay payments, fail to settle transactions, or trigger replacement costs. These effects can create unexpected cash needs and can become particularly severe when exposures are concentrated in a small number of counterparties. Accordingly, sound liquidity-risk management requires ongoing assessment of counterparty creditworthiness, concentration, contingent funding dependencies, and the potential liquidity consequences of a downgrade or default. The Basel Committee's liquidity principles specifically call for banks to monitor funding concentrations and to manage liquidity risks arising from contingent exposures and counterparties. A prudent liquidity manager therefore treats a material decline in a key counterparty's financial condition as an early-warning indicator and may reduce reliance on that counterparty or prepare alternative sources of liquidity before a disruption occurs. See the Basel Committee's Principles for Sound Liquidity Risk Management and Supervision and the Basel liquidity-risk monitoring standards.

QUESTION NO: 37

The backtesting of VaR estimates under the Basel accord requires comparing the ex-ante VaR to:

A. hypothetical profit and loss keeping the positions constant

B. the Basel accord does not require banks to backtest VaR estimates

C. ex-ante VaR calculated for the subsequent periods

D. realized profit and loss for the period

ANSWER: D

Explanation:

"Realized profit and loss for the period" is correct because Basel's VaR backtesting framework assesses whether a bank's ex-ante, typically one-day, VaR estimate was sufficient in light of the profit or loss actually experienced over that same holding period. A backtesting exception occurs when the trading loss realized during the day exceeds the VaR forecast made at the previous day's close. Banks must record and review such exceptions over a rolling observation period, conventionally 250 trading days. The number of exceptions is used in the Basel traffic-light approach to inform supervisory assessment and, where appropriate, a multiplication-factor adjustment to the market-risk capital requirement. This comparison is fundamental because VaR is a forward-looking estimate of a loss threshold; comparing it to the subsequently realized daily P&L tests whether the model's stated confidence level and risk coverage are consistent with observed outcomes. Basel guidance also recognizes that P&L definitions should be applied consistently and that institutions should investigate exceptions, including whether they reflect model limitations, data issues, or unusual market conditions. See the Basel Committee's Supervisory framework for the use of backtesting and the 1996 Market Risk Amendment.

QUESTION NO: 38

Which of the following best describes the concept of marginal VaR of an asset in a portfolio:

A. Marginal VaR is the value of the expected losses on occasions where the VaR estimate is exceeded.

B. Marginal VaR is the contribution of the asset to portfolio VaR in a way that the sum of such calculations for all the assets in the portfolio adds up to the portfolio VaR.

C. Marginal VaR is the change in the VaR estimate for the portfolio as a result of including the asset in the portfolio.

D. Marginal VaR describes the change in total VaR resulting from a $1 change in the value of the asset in question.

ANSWER: D

Explanation:

Marginal VaR describes the change in total VaR resulting from a $1 change in the value of the asset in question. It is the sensitivity, or partial derivative, of portfolio VaR with respect to the position value (or equivalently, a small change in that position's exposure), holding the remainder of the portfolio fixed. In notation, for position value V_i, marginal VaR is commonly written as $\partial \mathrm{VaR}_p / \partial V_i$. Thus, it answers a local risk-sensitivity question: how much does the portfolio's stated VaR increase or decrease when the exposure to this particular asset is increased by one dollar?

This measure is especially useful for portfolio risk management because it identifies the direction and magnitude of each position's immediate effect on aggregate market risk, while incorporating diversification and correlation through the portfolio VaR calculation. For a sufficiently small exposure change, the resulting change in portfolio VaR is approximately marginal VaR multiplied by the change in the position's value. Marginal VaR is therefore a derivative-based measure, rather than a stand-alone loss estimate. The terminology and decomposition of VaR risk contributions are discussed in the GARP Financial Risk Manager curriculum overview and in the PRMIA Professional Risk Manager certification materials overview.

QUESTION NO: 39

Financial institutions need to take volatility clustering into account:

I. To avoid taking on an undesirable level of risk

II. To know the right level of capital they need to hold

III. To meet regulatory requirements

IV. To account for mean reversion in returns

A. II, III and IV

B. I & II

C. I, II and III

D. I, II and IV

ANSWER: B

Explanation:

I & II is correct because volatility clustering means that large market moves, whether positive or negative, tend to be followed by further large moves, while tranquil periods also tend to persist. Consequently, conditional volatility changes through time and can differ materially from an unconditional or long-run average. A risk measure based only on a fixed historical average may therefore understate exposure during a high-volatility regime or overstate it during a low-volatility regime.

Recognizing this persistence enables a financial institution to update risk estimates, limits, hedges, and position sizes as current market conditions evolve. This helps prevent the institution from inadvertently maintaining exposures that create an undesirable level of risk relative to its appetite. It also supports sound capital planning: capital is intended to absorb unexpected losses, and the amount of risk capital needed depends on the current and prospective volatility of the underlying exposures. Conditional-volatility approaches, including ARCH and GARCH models, were developed specifically to model this time-varying behavior. The original ARCH contribution is summarized by the Nobel Prize. The Basel market-risk framework likewise emphasizes risk measurement that remains responsive to stressed market conditions; see the Basel Committee's minimum capital requirements for market risk.

QUESTION NO: 40 - (SIMULATION)

Which of the following statements are true in relation to Monte Carlo based VaR calculations:

I. Monte Carlo VaR relies upon a full revalution of the portfolio for each simulation

II. Monte Carlo VaR relies upon the delta or delta-gamma approximation for valuation

III. Monte Carlo VaR can capture a wide range of distributional assumptions for asset returns

IV. Monte Carlo VaR is less compute intensive than Historical VaR

ANSWER: See the explanation for the answer

Explanation:

Correct answer: Statements I and III are true.

I. True: Monte Carlo VaR generally simulates risk-factor scenarios and performs a *full revaluation* of the portfolio under each scenario. This accommodates nonlinear instruments such as options.
II. False: Delta or delta-gamma valuation is characteristic of parametric/variance-covariance approximations. Although approximations can sometimes be used to speed up simulations, they are not the defining basis of Monte Carlo VaR.
III. True: Monte Carlo methods can model many return distributions and dependence structures, rather than being restricted to normally distributed returns.
IV. False: Because numerous simulated scenarios and portfolio revaluations are required, Monte Carlo VaR is generally more computationally intensive—not less—than Historical VaR.

Therefore, select **I and III only**.

QUESTION NO: 41

If the 99% VaR of a portfolio is $82,000, what is the value of a single standard deviation move in the portfolio?

A. 50000

B. 35248

C. 134480

D. 82000

ANSWER: B

Explanation:

The correct answer is **35248**. Under the normal, parametric VaR convention assumed by this question, a one-day 99% VaR is the portfolio's standard deviation multiplied by the one-tailed 99% standard-normal quantile, approximately 2.3264. Thus, the portfolio standard deviation is calculated as $82,000 ÷ 2.3264 = $35,247.6, which rounds to $35,248.

This result represents the estimated size of a one-standard-deviation adverse move in the portfolio over the VaR horizon, subject to the usual parametric-VaR assumptions: returns are modeled using a normal distribution, the stated VaR horizon matches the standard-deviation horizon, and the VaR figure does not include a separate mean-return adjustment. The 2.3264 multiplier is the appropriate z-score because VaR uses a one-tailed loss quantile: at 99% confidence, only 1% of modeled outcomes are expected to exceed the reported loss threshold. This normal-quantile relationship is a core calculation used in market-risk measurement and VaR interpretation. See PRMIA's PRM certification information and NIST's reference material on the normal distribution.

QUESTION NO: 42

Which of the following statements are true:

I. The sum of unexpected losses for individual loans in a portfolio is equal to the totalunexpected loss for the portfolio.

II. The sum of unexpected losses for individual loans in a portfolio is less than the totalunexpected loss for the portfolio.

III. The sum of unexpected losses for individual loans in a portfolio is greater than the totalunexpected loss for the portfolio.

IV. The unexpected loss for the portfolio is driven by the unexpected losses of theindividual loans in the portfolio and the default correlation between these loans.

A. I and II

B. I, II and III

C. III and IV

D. II and IV

E. The sum of unexpected losses for individual loans in a portfolio is equal to the totalunexpected loss for the portfolio.

II. The sum of unexpected losses for individual loans in a portfolio is less than the totalunexpected loss for the portfolio.

III. The sum of unexpected losses for individual loans in a portfolio is greater than the totalunexpected loss for the portfolio.

IV. The unexpected loss for the portfolio is driven by the unexpected losses of theindividual loans in the portfolio and the default correlation between these loans.

ANSWER: C

Explanation:

III and IV is the correct selection. Unexpected loss is commonly measured as the volatility (standard deviation) of credit loss around expected loss. At portfolio level, loss volatility is calculated from the individual loan loss variances together with the covariance terms between loans. Consequently, the portfolio unexpected loss reflects both each exposure's standalone unexpected loss and the degree to which defaults and losses move together.

In a normally diversified credit portfolio, the sum of standalone unexpected losses is greater than the portfolio unexpected loss. The reason is diversification: individual loan-loss volatilities do not simply add, because obligors do not generally default simultaneously. Mathematically, the portfolio variance includes correlation-weighted covariance terms, and taking the square root of that variance produces a portfolio standard deviation below the simple sum of standalone standard deviations when correlations are below perfect positive correlation. The magnitude of this diversification benefit is therefore directly controlled by default correlation. Higher default correlation reduces diversification and increases portfolio unexpected loss; lower correlation increases diversification and reduces it.

This treatment is consistent with credit portfolio risk practice and regulatory credit-risk frameworks, which recognize that risk is driven by both exposure-level loss characteristics and dependence among obligors. See the Basel Committee's International Convergence of Capital Measurement and Capital Standards and its discussion of credit risk transfer and correlation.

QUESTION NO: 43

Under the credit migration approach to assessing portfolio credit risk, which of the following are needed to generate a distribution of future portfolio values?

A. The forward yield curve

B. A specified risk horizon

C. A rating migration matrix

D. All of the above

ANSWER: D

Explanation:

All of the above is correct. A credit-migration model, such as the framework commonly associated with CreditMetrics, projects the portfolio's value at a defined future horizon after issuers may have migrated among credit-rating states, including default. The specified risk horizon establishes the date at which the revaluation is performed and aligns the migration probabilities with the measurement period. A rating migration matrix supplies the probabilities of moving from each current rating to each possible future rating over that horizon. These probabilities determine the possible credit states that must be reflected in the simulated or otherwise generated portfolio-value distribution. A forward yield curve, or rating-specific forward credit spread/discount curve, is then required to value each instrument conditional on its future rating state. Discounting the instrument's remaining contractual cash flows using the curve appropriate to that future credit quality produces the state-contingent future value. Combining the migration states and their probabilities across obligors, with dependence assumptions where relevant, produces the distribution of future portfolio values from which credit risk measures such as Credit VaR may be derived. This is consistent with the CreditMetrics methodology described by J.P. Morgan at CreditMetrics Technical Document and the Basel framework's discussion of credit-risk measurement at Basel Committee: International Convergence of Capital Measurement and Capital Standards.

QUESTION NO: 44

Which of the following introduces model error when basing VaR on a normal distribution with a static mean and standard deviation?

A. Heavy tails

B. Volatility clustering

C. Autocorrelation of squared returns

D. All of the above

ANSWER: D

Explanation:

All of the above is correct because each listed empirical feature conflicts with the assumptions embedded in a VaR model that uses a normal return distribution and fixed mean and standard deviation. Heavy tails mean that extreme gains and losses occur more frequently than a normal distribution predicts. As a result, a normal-distribution VaR estimate can materially understate the probability and magnitude of large losses, particularly at high confidence levels. Volatility clustering means that periods of high volatility tend to be followed by high volatility and quiet periods by quiet periods; therefore, volatility is time-varying rather than static. A VaR model calibrated with one constant standard deviation will be slow to reflect current risk conditions. Autocorrelation of squared returns is a common statistical signature of conditional heteroskedasticity:

although raw returns may exhibit little serial correlation, return magnitudes and variances are dependent over time. This violates the independent, identically distributed framework commonly implicit in static normal VaR. Consequently, all three characteristics create specification risk, or model error, when the model is used without methods that accommodate fat tails and changing conditional volatility. For background on VaR assumptions and limitations, see the Basel Committee's market-risk framework and the Risk.net definition of Value at Risk.

QUESTION NO: 45

Which of the following are likely to be useful to a risk manager analyzing liquidity risk for an international bank?

I. Information on liquidity mismatches

II. Funding concentration

III. Lending concentration

IV. A report on illiquid assets

A. I and II

B. III and IV

C. I, II, III and IV

D. I, II and IV

ANSWER: C

Explanation:

I, II, III and IV is correct because each item contributes to a sound assessment of an international bank's liquidity-risk profile. Liquidity-mismatch information identifies differences between the timing of expected cash inflows and cash outflows across maturity buckets and is fundamental to measuring both contractual and behavioral funding gaps. Funding-concentration analysis shows whether the bank relies excessively on a limited set of depositors, wholesale providers, currencies, markets, or funding instruments, which can make replacement funding difficult in a stress event. Lending concentration is also relevant because a concentrated loan book may cause cash inflows, drawdowns on committed facilities, and credit-related liquidity demands to become highly correlated during sectoral or geographic stress. A report on illiquid assets is necessary to determine the bank's capacity to generate cash through asset sales or secured funding, including the likely timing and valuation impact of liquidation under stressed market conditions. Together, these reports support a forward-looking view of cash-flow needs, funding resilience, and the availability of liquidity buffers. The Basel Committee's liquidity standards similarly emphasize cash-flow mismatches, funding concentration, committed facilities, and the liquidity characteristics of assets. See the Basel Committee's Principles for Sound Liquidity Risk Management and Supervision and the associated liquidity-risk management guidance.

QUESTION NO: 46

Which of the following statements is true:

I. Expected credit losses are charged to the unit's P&L while unexpected losses hit risk capital reserves.

II. Credit portfolio loss distributions are symmetrical

III. For a bank holding $10m in face of a defaulted debt that it acquired for $2m, the bank's legal claim in the bankruptcy court will be $10m.

IV. The legal claim in bankruptcy court for an over the counter derivatives contract will be the notional value of the contract.

A. I and III

B. I, II and IV

C. III and IV

D. II and IV

ANSWER: A

Explanation:

I and III is correct. Expected loss is the anticipated, average credit cost of extending credit over a given horizon. It is a normal cost of the lending business and is therefore reflected through pricing, loan-loss provisions, and the business unit's profit and loss. Unexpected loss is the variability around that expected outcome, particularly losses arising from adverse default and recovery outcomes beyond the expected level. Banks hold regulatory and economic capital to absorb this unexpected component and remain solvent under stressed conditions. This expected-loss/unexpected-loss distinction is fundamental to credit-risk capital management and is reflected in the Basel framework's treatment of provisions and capital. See the Basel Framework: IFRS 9 transitional arrangements.

A creditor's bankruptcy claim for defaulted debt is generally based on the debt obligation's allowed contractual amount, subject to applicable bankruptcy-law adjustments, rather than the price the creditor paid to acquire the claim in the secondary market. Thus, a holder that purchased a debt instrument with $10 million face amount for $2 million ordinarily asserts a $10 million claim. The purchase price determines the investor's economic gain or loss, not the stated amount of the underlying debt claim. The statutory basis for allowance of claims is set out in 11 U.S.C. § 502.

QUESTION NO: 47

What would be the consequences of a model of economic risk capital calculation that weighs all loans equally regardless of the credit rating of the counterparty?

I. Create an incentive to lend to the riskiest borrowers

II. Create an incentive to lend to the safest borrowers

III. Overstate economic capital requirements

IV. Understate economic capital requirements

A. III only

B. I and IV

C. II and III

D. I only

ANSWER: B

Explanation:

I and IV is correct because economic capital should reflect the unexpected-loss risk of each exposure, including the borrower's probability of default, loss severity, exposure size, and the way defaults co-vary across the portfolio. If every loan receives the same capital charge irrespective of the counterparty's credit quality, a risky loan consumes no more capital than a safer loan of otherwise comparable size. This distorts risk-adjusted performance measurement: higher-risk borrowers generally offer higher contractual yields or spreads, so lending staff can improve apparent returns by selecting riskier credits without being charged for the additional economic risk. That creates an incentive to lend to the riskiest borrowers.

As the portfolio consequently shifts toward weaker-quality counterparties, its true unexpected-loss exposure rises. A flat or rating-insensitive capital model does not increase required capital in line with that deterioration. The capital figure will therefore be too low relative to the capital needed to absorb losses at the institution's chosen solvency confidence level, meaning economic capital requirements are understated. This reflects the core principle that internal capital assessment must be commensurate with the institution's material risks and risk profile. See the Basel Committee's International Convergence of Capital Measurement and Capital Standards and the Federal Reserve's ICAAP supervisory guidance.

QUESTION NO: 48

Which of the following are likely to be useful to a risk manager analyzing liquidity risk for an international bank?

I. Information on liquidity mismatches

II. Funding concentration

III. Lending concentration

IV. A report on illiquid assets

A. I and II

B. III and IV

C. I, II, III and IV

D. I, II and IV

E. Information on liquidity mismatches

II. Funding concentration

III. Lending concentration

IV. A report on illiquid assets

ANSWER: C

Explanation:

"I, II, III and IV" is correct because a sound liquidity-risk assessment must address both the timing of cash flows and the bank's capacity to obtain cash or liquidate assets under normal and stressed conditions. Information on liquidity mismatches identifies expected gaps between contractual and behavioural cash inflows and outflows across time buckets. This is central to measuring whether obligations can be met as they fall due. Funding-concentration information identifies dependence on particular depositors, wholesale markets, currencies, or funding providers, which is particularly important for an international bank that may face disruptions in one market or jurisdiction. Lending concentration is also relevant because concentrated credit exposures can create correlated drawdowns on committed facilities, reduce expected repayments, or impair the liquidity of related assets during stress. Finally, a report on illiquid assets is essential to determine how much of the balance sheet cannot be sold, pledged, or monetised quickly without substantial loss. Together, these inputs support cash-flow projections, contingency-funding planning, stress testing, and assessment of the stock of readily available liquidity. The Basel Committee's liquidity principles emphasise measuring cash-flow needs, funding concentrations, and marketability of assets; see Basel's Principles for Sound Liquidity Risk Management and Supervision and the Basel III Liquidity Coverage Ratio standard.

QUESTION NO: 49

Which of the following statements is the most appropriate description of feedback effects:

A. The amplification of smaller initial shocks to one risk factor creating larger subsequent shocks through system-wide interactions between other risks, creating self-perpetuating downward stresses in the markets

B. The lack of a comprehensive view of risk across credit, market and liquidity risks leading to an underestimation of correlations that tend to spike up in the event of a crisis

C. The spread of contagion from the bankruptcy of one participant leading to a similar outcome for other market participants

D. The revision of stress testing scenarios based upon management, business unit and regulatory feedback on the plausibility or otherwise of stress scenarios.

ANSWER: A

Explanation:

The amplification of smaller initial shocks to one risk factor creating larger subsequent shocks through system-wide interactions between other risks, creating self-perpetuating downward stresses in the markets is the most appropriate description of feedback effects. A feedback effect is a dynamic, reinforcing mechanism: an initial adverse move, such as a decline in asset values or a rise in margins, changes institutions' behaviour in ways that intensify the original shock. For example, falling prices can prompt deleveraging and asset sales; those sales add market pressure, cause further price falls, weaken liquidity, and potentially trigger additional collateral calls or risk-limit breaches. The key characteristic is therefore not merely that several risks occur together, but that their interactions create an endogenous loop that magnifies stress over time. This is particularly important in system-wide stress testing, where market, credit, funding-liquidity, and counterparty channels cannot always be treated as independent or static. The Basel Committee's stress-testing principles specifically emphasize capturing interactions among risks and feedback effects when assessing severe but plausible conditions. The Financial Stability Board likewise identifies amplification mechanisms, including liquidity spirals and fire sales, as central features of systemic stress. See the Basel Committee's Principles for sound stress testing practices and supervision and the Financial Stability Board's review of market turmoil and amplification mechanisms.

QUESTION NO: 50

A bank has interest-sensitive assets of $100m with a duration of 4 years and interest-sensitive liabilities of $90m with a duration of 2.5 years. What is the bank's duration gap?

A. 0.25 years

B. 1.50 years

C. 1.75 years

D. 6.25 years

ANSWER: C

Explanation:

The correct answer is **1.75 years**. Duration gap is calculated as the duration of assets less the duration of liabilities multiplied by the ratio of liabilities to assets. Thus, the duration gap is 4.0 minus (2.5 × $90m/$100m) = 4.0 minus 2.25 = 1.75 years.

A positive duration gap means that the economic value of assets is more sensitive to an interest-rate increase than the economic value of liabilities. Consequently, all else equal, an increase in interest rates reduces the economic value of equity. Duration-gap analysis is a core asset-liability-management technique for assessing the exposure of a bank's economic value to parallel interest-rate movements. The Basel Committee's interest-rate-risk guidance is available in its Interest rate risk in the banking book standard.

QUESTION NO: 51

The loss severity distribution for operational risk loss events is generally modeled by which of the following distributions:

I. the lognormal distribution

II. The gamma density function

III. Generalized hyperbolic distributions

IV. Lognormal mixtures

A. II and III

B. I, II and III

C. I, II, III and IV

D. I and III

ANSWER: C

Explanation:

I, II, III and IV is correct because operational-risk loss severity modelling requires flexible positive-valued distributions that can represent the strongly right-skewed and potentially heavy-tailed nature of observed loss amounts. The lognormal distribution is a standard severity model: it is defined on positive values and naturally produces substantial right skew. Gamma density functions are also widely used for positive loss data and provide a useful range of skewness shapes. Generalized hyperbolic distributions offer additional tail and asymmetry flexibility, which can be valuable when empirical loss data do not conform well to simpler parametric families. Lognormal mixtures combine multiple lognormal components, allowing a model to reflect heterogeneous event populations, such as relatively frequent moderate losses together with rarer, much larger losses. In loss-distribution approaches, firms select and validate severity models based on the data, business environment, tail behavior, and the purpose of the capital or risk estimate; there is no single universally mandatory severity family. This flexibility is consistent with the Basel framework's requirement that operational-risk measurement capture loss distributions and their relevant characteristics. See the Basel Committee's operational-risk standard and the BIS FSI summary of operational-risk management.