2020年10月FRM二级模拟考试（一）

1. A risk consultant is reviewing a bank's process for implementing its economic capital framework. The bank holds a wide variety of derivative exposures with various counterparties, some of which have posted collateral. In describing guidelines for evaluating the bank's counterparty credit risk, which of the following statements is correct?
   A. Operational risks related to counterparty exposure are generally easy to quantify and integrate into capital model.
   B. Wrong-way risk arises when the probability of default and loss given default increase at the same time that the exposure to the counterparty is falling.
   C. VaR models are generally preferred to simulations in assessing long-term uncollateralized counterparty exposures.
   D. In modeling exposure, a longer forecasting period should be used for non-margined counterparties compared to counterparties who have posted margin.

2. Treasury managers at a bank are planning to enter into a repurchase agreement (repo) transaction with a large hedge fund. In this transaction, the bank will borrow a fixed sum of cash while lending USD 100 million par value in Treasury bonds to the hedge fund. Which statement below is correct regarding the mechanics of this repo transaction?
   A. A higher bond price reduces the hedge fund's credit exposure to the bank.
   B. The repo rate for securities trading "special" is higher than the rate for general securities.
   C. A positive repo rate results in a forward repurchase price that is lower than the bond's initial repo price.
   D. A repo transaction's term and rate are normally set equal to the maturity and coupon of the underlying security.

3. Which of these statements regarding risk factor mapping approaches is/are correct?
   I. Under the cash flow mapping approach, only the risk associated with the average maturity of a fixed-income portfolio is mapped.
   II. Cash flow mapping is the least precise method of risk mapping for a fixed-income portfolio.
   III. Under the duration mapping approach, the risk of a bond is mapped to a zero-coupon bond of the same duration.
   IV. Using more risk factors generally leads to better risk measurement but also requires more time to be devoted to the modeling process and risk computation.

A. I and II

B. I, III, and IV

C. III and IV

D. IV only

4. Each of the following is true about the liquidity risk typology except which is false?

A. Liquidity risk has three major types: 1. Transaction (aka, asset, market); 2. Funding (aka, cash flow, balance sheet); and 3. Systemic (aka, crisis)

B. Transaction liquidity risk is low if assets can be liquidated or a position can be covered quickly, cheaply, and without moving the price too much

C. A key example of funding (aka, cash flow or balance sheet) liquidity risk is the rollover risk created by the maturity transformation function in a traditional depository institution

D. The liquidity risk typology is well-defined into three buckets because the three major liquidity risk types do not interrelate; e.g., funding risk is not due to systemic causes; transaction risk does not constrain funding liquidity

5. Assume a $1 billion corporate loan portfolio offers a return of 5% per annum. The bank has a direct operating cost of $6 million per annum and an effective tax rate of 25%. The portfolio is funded by $1 billion in retail deposits with a transfer-priced interest rate charge of 1.4%. Risk analysis of the unexpected losses associated with the portfolio tell us we need to set aside economic capital of $80 million against the portfolio. The bank's economic capital must be invested in risk-free securities and the risk-free rate on government securities is only 1%. The expected loss on the portfolio is assumed to be 1% per annum. Which is nearest to the risk-adjusted return on capital (RAROC)?

A. 8.75%

B. 13%

C. 19.5%

D. 25.25%

6. Saugatuck National Bank uses the internal model-based approach to set market risk capital as prescribed by the 1996 Amendment to the 1988 Basel Accord. The Bank has backtested its 99%, one-day VaRs against the actual losses over the last 250 trading days. Based on the results of the backtesting, the bank recorded 11 exceptions. Based on these results, the multiplicative factor (m_c) in the model should be set:

A. Less than 3.

B. Equal to 3.

C. Between 3.1 and 3.9.

D. Equal to 4.

7. Risk managers at a growing bank are implementing the loss distribution approach to model the bank's operational risk capital. Which distribution would be the most appropriate for the bank to use to model the severity of operational loss events?

A. Exponential

B. Lognormal

C. Truncated normal

D. Poisson

8. A portfolio manager's "bogey" is a benchmark portfolio invested in three components: 60.0% in the S&P 500 (the equity index), 30.0% in a Lehman Bond Index (the bond index), and 10.0% in a money market fund (the cash index). A portfolio passively invested in this bogey portfolio would have returned +4.0% over the period. The manager's actual portfolio components included 70.0% in equities, 20.0% in bonds, and 10.0% in cash. The manager's actual portfolio underperformed the bogey by 90 basis points (i.e., 3.1% actual portfolio return compared to a 4.0% bogey portfolio return):

Bogey Portfolio Comp't	Index	Benchmark Weight	Index Return	Bogey Portfolio Return
Equity	S&P 500	60%	5%	3%
Bonds	Lehman	30%	3%	0.9%
Cash	Money	10%	1%	0.1%
Return on Bogey				4%

Managed Portfolio Comp't	Actual Portfolio Weight	Actual Return	Portfolio Return
Equity	70%	4%	2.8%
Bonds	20%	1%	0.2%
Cash	10%	1%	0.1%
Return on Managed Portfolio			3.1%
Excess Return on Managed Portfolio			-0.9%

If the excess return of -0.9% is decomposed into two components, asset allocation and security selection, what is the contribution to the excess return from asset allocation?

A. -1.10%

B. -0.70%

C. -0.20%

D. +0.20%

9. A CFO has asked for a review of the bank's contingency funding plan and would like to ensure that key components are incorporated. Which of the following is a correct statement regarding the key components to be found in an effective contingency funding plan (CFP)?

   A. Liquidity stress testing scenarios are designed to focus solely on institution-specific risks and address both market (asset) liquidity and funding liquidity, over short-term and prolonged stress periods.

   B. Institutions should align their CFP stress scenarios to those in its liquidity stress testing framework, as well as to other frameworks such as recovery and resolution plans

   C. Identification of contingent actions such as maintaining investment strategies to reinvest maturing securities in order to maximize and maintain bank profitability during stressed periods

   D. The liquidity crisis team may invoke the CFP based on a review of the markets, industry, bank-specific conditions, and liquidity stress testing results.

10. Peter is an analyst who works for a hedge fund. Unlike many of his peers from business school, who work for funds that cannot much drift from their somewhat narrowly defined investment styles, Peter's fund has broad discretion with respect to both location of opportunity and trade tactics. However, his fund does tend to make directional bets in liquid, often highly liquid, markets. For which type of hedge fund does Peter most likely work?

    A. Equity market neutral

    B. Global macro

    C. Convertible arbitrage

    D. Distressed debt

11. According to Basel II, the basic indicator and standardized approaches to operational risk require banks to hold capital for operational risk equal to a fixed percentage of gross income. The difference between the two approaches is that under the standardized approach:

    A. Banks must calculate a capital requirement for each business line, rather than at the firm level as in the basic indicator approach.

    B. Banks must calculate separate capital requirement for rated and unrated exposures rather than at the firm level as in the basic indicator approach.

    C. The capital requirement is a higher percentage of income than in the basic indicator approach.

    D. The capital requirement is a lower percentage of income than in the basic indicator approach.

12. Westover Fund is a portfolio consisting of 42% fixed-income investments and 58% equity investments. The manager of the Westover Fund recently estimated that the annual VaR (5%), assuming a 250-day year, for the entire portfolio was $1,367,000 based on the portfolio's market value of $12,428,000 and a correlation coefficient between stocks and bonds of 0. If the annual loss in the equity position is only expected to exceed $1,153,000 5% of the time, then the daily expected loss in the bond position that will be exceeded five percent of the time is closest to:
    A. $46,445.
    B. $72,623.
    C. $55,171.
    D. $21,163.

13. In applying for a mortgage loan, a borrower who is seeking approval prefers a lower number for each of the following variables in her application, ceteris paribus, except for which does she not necessarily prefer a lower number?
    A. DTI ratio
    B. FICO score
    C. LTV ratio
    D. Number of recent inquiries

14. A binomial interest-rate tree indicates a 1-year spot rate of 4% and the price of the bond if rates decline is 95.25 and 93.75 if rates increase. The risk-neutral probability of an interest rate increase is 0.55. You hold a call option on the bond that expires in one year and has an exercise price of 93.00. The option value is closest to:
    A. 1.17.
    B. 0.97.
    C. 1.44.
    D. 1.37.

15. A particular basket CDS has 100 reference entities and makes a payoff when the 25th reference entity defaults. Which of the following statements regarding this basket CDS is correct?
    A. If the default correlation is equal to 1, the value of the basket CDS will be greater than the value of a first-to-default CDS.
    B. If the default correlation is negative, the value of the basket CDS will be greater than the

value of a first-to-default CDS.

C. If the default correlation is zero, the value of the basket CDS will be less than the value of a first-to-default CDS.

D. As default correlation increases, the value of the basket CDS will decrease.

16. As a risk manager for Acme Bank, you are asked to calculate the market risk capital requirement for the bank's trading book. Your inputs for both value at risk and stressed value at risk are determined based on a 95% confidence level and a one-day horizon. For the most recent trading day, the VaR input is USD $40,000 and the 95% one-day SVaR input is USD $70,000. The 60-day average daily VaR is $10,000 and the 60-day average daily SVaR is $50,000. Both multiplication factors are set at the minimum of 3.0. What is the capital requirement charge?

A. $178,899

B. $670,870

C. $849,566

D. 1,028,688

17. XYZ Hedge Fund wants to get exposure to a high-yield pool of commercial loans without actually investing in the loans. It wants a leverage ratio of 6. If the hedge fund is willing to invest $35 million in this investment, which credit derivative is best for them and what is their expected return given that the reference asset earns LIBOR plus 285 basis points, the counterparty earns LIBOR plus 100 basis points, and the required collateral earns 3.5%.

A. Total return swap with a 14.6% return.

B. Asset-backed credit-linked note with a 14.6% return.

C. Total return swap with an 11.34% return.

D. Asset-backed credit-linked note with an 11.34% return.

18. The CEO of a large bank has reported that the bank's tools and processes for managing operational risk are consistent with Basel II and Basel III guidelines for operational risk governance. Which of the following actions and principles of the bank is correct?

A. The bank uses outsourcing to mitigate the operational risk that should be addressed by the management.

B. As the highest level executive of senior management, the CEO approves the bank's risk appetite and tolerance statement for operational risk.

C. The operational risk management framework established by the bank is subject to independent review.

D. Department managers monitor their departments' operational risk profiles and losses and enforce compliance with company risk policies.

19. In detailing the terms of a collateralization agreement, Barbara seeks to mitigate her firm's exposure to a counterparty default, as much as possible. If she could afford the increased operational workload, she would prefer to perfectly mitigate the exposure. Each of these adjustments will tend to successfully increase the degree of mitigation except for which will not?
    A. Increase the independent amount
    B. Increase the threshold
    C. Decrease the minimum transfer amount
    D. Increase the margin call frequency

20. Let firm value equal $1 billion with face value of debt equal to $800 million. The debt is zero-coupon and matures in four years. The riskless rate is 5.0%. The estimate of the volatility of the firm is 20% per annum. The firm's assets are expected to grow at 10% per annum. What does the Merton model return for the value of the firm's equity? (N(1.25786) = 0.8958; N(0.85786) = 0.8045)
    A. $200 million
    B. $330 million
    C. $369 million
    D. $399 million

21. In a two-position portfolio consisting of positions X and Y, it is found that the marginal VaR of X is greater than that of Y. Using this information, which of the following is most likely to be true? Increasing the allocation to:
    A. Y and/or reducing the allocation to X will move the portfolio toward the optimal portfolio.
    B. X and/or reducing the allocation to Y will lower the VaR of the portfolio.
    C. X and/or reducing the allocation to Y will move the portfolio toward the optimal portfolio.
    D. Y and/or reducing the allocation to X will lower the VaR of the portfolio.

22. You are analyzing an equity position of 100,000 shares in an illiquid, non-public stock which has a current price of USD 44 per share. The estimated daily return volatility is 80 bps. The bid-ask spread is USD 0.11. If you assume the daily expected return is zero and the bid-ask spread is constant, which is nearest to the one-day 95% liquidity-adjusted value at risk (VaR)?

A. $38,500

B. $49,250

C. $57,780

D. $63,400

23. Chery Springhorn, FRM, is testing the capital adequacy of two large depository institutions. She has accumulated the following information on historical returns and standard deviations (which are normally distributed). Following current regulations, she will test each bank's VaR at a 95% confidence level. Which of the following statements best describes her findings?

	Bank A	Bank B
Mean P/L	12%	8%
Standard deviation P/L	10%	6%
Default frequency	2%	6%

A. Bank A's VaR is roughly two times greater than Bank B's VaR.

B. Bank B's VaR is roughly two times greater than Bank A's VaR.

C. Bank B's VaR is less than Bank A's VaR which is less than two times Bank B's VaR.

D. Bank A's VaR is less than Bank B's VaR which is less than two times Bank A's VaR.

24. Terminal cash flow information for senior, junior and equity tranches are provide as follows.

- The original loan pool included 100 loans with $1 million par value each and a fixed coupon of 8%.
- The number of surviving loans is 92.
- The par for the senior and junior tranches is 80% and 15%, respectively. The equity investors contributed the remaining 5%.
- There were two defaults with recovery rates of 40% recovered at the end of the period.
- The value of the trust account at the beginning of the period was $10 million earning 4% annually.
- The pool will terminate at the end of the fourth year.

The mezzanine and equity tranche cash flows are closest to which of the following amounts?

	Mezzanine cash flow	Equity cash flow
A.	$15,000,000	$0
B.	$16,000,000	$0
C.	$15,000,000	$15,500,000
D.	$16,000,000	$15,500,000

25. Income Partners, the protection buyer, purchases a credit default swap (CDS) from

Institutional Traders, who sells protection by writing the CDS. The CDS is marked-to-market and the reference entity of the CDS is Acme Corporation. Each of the following is true except which is not?

A. Income Partners has more exposure than its counterparty, Institutional Traders, due to potential future exposure at high confidence levels.

B. In regard to the exposure faced by Income Partners due to the CDS: the credit spread of Acme Corporation does not have an impact; however, the credit spread of Institutional Traders does impact this credit exposure.

C. In the event of a bankruptcy by Institutional Traders, Income Partners will likely be pari passu with the firm's senior, unsecured bondholders.

D. Exposure faced by Income Partners, with respect to Institutional Traders, will be measured gross of recovery; but the estimated recovery rate will impact the quantification of counterparty risk via the credit value adjustment.

26. With respect to a macro-financial analysis, the Financial Stability Board's Financial Innovation Network (FSB FIN, November 2017) argues that "widespread adoption of AI and machine learning could impact the financial system in a number of ways, depending on the nature of the application." From a macro perspective, which of the following statements about the potential implications of artificial intelligence and machine learning (AI&ML) is TRUE?

A. A key vulnerability of AI&ML is its tendency to constrain economies of scope; that is, to promote dis-economies of scope

B. In insurance markets, although AI&ML is likely to increase the degree of moral hazard and adverse selection, it should create larger, fewer risk pools

C. Robo-advisors are likely to increase market liquidity but at the risk of higher volatility and less stability as more participants are exposed to the same correlated common factors

D. A concern is that AI&ML might favor a greater concentration of fewer, larger organizations including advanced third-party AI&ML providers, owners of proprietary sources of big data, and those able to afford heavy investments in such innovative technologies

27. Sally, the Risk Market Analyst, calculated implied volatilities based on call options for Google's traded equity. As it turns out, the shape of the corresponding implied volatility skew is somewhat typical of equity options; i.e., downward sloping per decreasing implied volatility as a function of increasing strike price. She draws the following conclusions:

I. The implied distribution of Google's stock price has negative skew and negative excess kurtosis

II. For identical maturities, an in-the-money call (ITM call) option on Google's stock is more expensive than an out-of-the-money put (OTM put) option

III. Compared to the normal distribution, the implied distribution of Google's stock price has a lighter left tail

IV. Compared to the lognormal distribution, the implied distribution of Google's stock price has a lighter right tail

Which of her above conclusions is necessarily true?

A. None

B. I. only

C. IV. only

D. II. and III. only

28. Following the 2007 – 2009 credit crisis, the Basel Committee realized that a major overhaul of Basel II was necessary. Basel III proposals were first published in December 2009. Following comments from banks, a quantitative impact study, and a number of international summits, the final version of the regulations was published in December 2010.

There are six parts to the regulations:

1. Capital Definition and Requirements
2. Capital Conservation Buffer
3. Countercyclical Buffer
4. Leverage Ratio
5. Liquidity Risk
6. Counterparty Credit Risk

The regulations are being implemented gradually between 2013 and 2019. Under Basel III, a bank's total regulatory capital consists of:

1. Tier 1 equity capital
2. Additional Tier 1 capital
3. Tier 2 capital. There is no Tier 3 capital

About the bank's total regulatory capital, each of the following is true except which is false?

A. Core Tier 1 capital includes share capital and retained earnings.

B. Core Tier 1 capital excludes goodwill and deferred tax assets.

C. Additional Tier 1 capital consists of items such as non-cumulative preferred stock that are not common equity.

D. Tier 2 capital is "going-concern capital" that must be equity, cannot be debt, and that ranks above depositors in a liquidation and also consists of items such as non-cumulative preferred stock.

29. Suppose a bank loan has the following characteristics:
- Gross revenues are \$1.3 million.
- Interest expense is \$0.3 million.
- The return on the \$5 million economic capital invested in T-bills is \$100,000.
- The firm's beta is 1.5.
- The unexpected loss for the loan is estimated at \$500,000.
- The adjusted RAROC is equal to 8%.
- Expected rate of return on the market portfolio is 6%.

What is the worst-case loss for this loan?

A. \$1.6 million.

B. \$2.3 million.

C. \$0.9 million.

D. \$0.75 million.

30. Jim Johannsen has collected a large data set of daily market returns for three emerging markets. He is concerned about the non-normal skew in the data and is considering non-parametric estimation methods. Johannsen is not familiar with these techniques and he discusses the procedure with his colleague Lily Tong. During the course of their discussion, Lily makes the following statements:

I. Age-weighted historical simulation reduces the impact of older observations only after surpassing a user-defined threshold.

II. Volatility-weighted historical simulation augments historic returns with an additive volatility adjustment.

III. Filtered historical estimation combines sophisticated parametric and dynamic volatility estimation techniques.

How many of Ms. Tong's statements are correct?

A. Zero.

B. One.

C. Two.

D. Three.

31. The credit value adjustment (CVA) is defined as the expected value or price of counterparty credit risk. A positive value represents a cost to the counterparty that bears a greater propensity to default. Which of the following items would increase the CVA charge?

A. Netting.

B. Collateralization.

C. Independent amount.

D. Minimum transfer amount.

32. A regional bank wants to improve its operational resilience to help keep pace with emerging best practices in this area. A consultant hired by the bank recommends that it establish a set of impact tolerances to improve its resilience. Which of the following correctly describes a potential benefit to the bank of establishing an impact tolerance?

A. It will enhance the bank's ability to identify and limit concentration risk

B. It will accurately estimate the severity of a potential disruption to an operational process and the amount of downtime that would result

C. It will help the bank optimize its allocation of resources to its most important business services

D. It will prevent failures of critical operational processes and the systems that support these processes

33. A bank buys a bond on its coupon payment date. Three months later, in order to generate immediate liquidity, the bank decides to repo the bond. Details of the bond and repo transaction are as follows:

Notional (USD)	100,000
Coupon (semi-annual)	6%
Current bond price	97
Repo haircut	10%
Repo interest	4%

If the repo contract expires 6 months from now, what is the bank's expected cash outflow at the end of the repo transaction?

A. USD 89,046

B. USD 90,423

C. USD 93,177

D. USD 100,470

34. How would the risk in a merger arbitrage strategy best be characterized?

A. The arbitrage can be structured so there is a gain no matter the outcome.

B. The arbitrageur's loss if the deal does not go through is much greater than the gain if the deal goes through.

C. The arbitrage can be structured as riskless, assuming no other bidders come forward after the initial offer.

D. The arbitrageur's gain on the deal if it does go through is much greater than the loss if the deal does not go through.

35. Implementing a strong and effective risk appetite framework (RAF) requires participation from a diverse group of managers, with each management group having important responsibilities. In following best practices when implementing the RAF, which responsibility is most appropriate for the given management group?

A. Each business line manager should determine their division's risk appetite, which are then combined to build the firm's overall RAF.

B. Senior management should be fully responsible for determining the firm's overall risk profile and approving any changes to the RAF over time.

C. The board of directors should periodically monitor and review the RAF to ensure it remains relevant to the firm's current business environment.

D. Business line managers should ensure that senior management adheres closely to the RAF.

36. There are two main EVT approaches: peaks-over-threshold (POT) and block-maxima. POT is characterized by a generalized Pareto (GP) distribution while block-maxima is characterized by a generalized extreme-value (GEV) distribution. Which of the following describes the necessary parameters for the POT GP distribution?

A. Only scale and tail/shape index parameters

B. Scale and tail/shape plus threshold (u) must be specified

C. Only scale, location, and tail/shape index parameters

D. Scale, location, and tail/shape index parameters plus threshold (u) must be specified

37. Marc Simon is a junior internal risk manager for a large financial institution. He has been assigned to prepare a report with regard to the impact of securitization on an originating firm such as theirs. He has gathered a substantial amount of information in the process. Which of the following statements should he include in his report?

A. Securitization involves a higher cost compared with firm financing.

B. Securitization involves additional monitoring costs of the borrowers by the loan originators.

C. Securitization allows poor performing loans to be transformed into a marketable investment.

D. Securitization does not improve a company's liquidity because it is only involves a reclassification between loans receivable and cash.

38. Which of the following is not an example or element of predatory lending:
    A. Lender makes unaffordable loans based on borrower assets rather than ability to repay
    B. Lender induces borrower to repeatedly refinance in order to collect fees and charge high points
    C. Borrower misrepresents income or employment in mortgage application
    D. Lender engages in deception to conceal true nature of loan; e.g., deceives borrower into thinking loan is fixed-rate when mortgage is actually an adjustable-rate.

39. Acme Bank is a small bank with three business lines (corporate finance, commercial banking, and asset management). The bank has experienced rapid growth in the last three years, as its annual gross income grew from -$7.0 million (three years ago) to $71.0 last year:

Acme's Annual Gross Income, Millions			
Business Line	Y-3	Y-2	Y-1
Corporate finance	-$20	$6	$22
Commercial banking	$8	$18	$24
Asset Management	$5	$13	$25
Total	-$7	$37	$71

Roger the analyst wants to apply a Basel approach to estimate Acme's Operational Risk Charge. First, he estimates the capital charge under the basic indicator approach (BIA). Then he assumes the standardized approach. For Acme Bank, what is the reduction in the charge implied by a shift from the BIA to SA approach?
    A. No reduction
    B. $2.8 million
    C. $4.7 million
    D. $9.0 million

40. A loan underwriter is assessing the risk of a loan application. Which of the following statements regarding creditworthiness is correct?
    I. A FICO score of 600 or above is considered by most credit scoring firms as a prime credit.
    II. Lower loan-to-value ratios are more favorable than high loan-to-value ratios.
    A. I only.
    B. II only.
    C. Both I and II.
    D. Neither I nor II.

41. A credit analyst is evaluating the liquidity of a small regional bank while preparing a report

for a credit committee meeting. With quarterly financial statements, the analyst calculates some relevant liquidity indicators over the past three years. Which of the following trends over this period should the analyst be most concerned about in the credit risk report?

A. The bank's average net federal funds and repurchase agreements position has been increasing

B. The bank's capacity ratio has been increasing

C. The bank's pledged securities ratio has been decreasing

D. The bank's loan commitments ratio has been decreasing

42. Joe Howard, FRM, is working on a convertible arbitrage strategy for a client, purchasing a firm's convertible security and simultaneously shorting the stock. What is the term for the process of managing the short position in the stock?

A. Binomial option pricing.

B. Gamma management.

C. Risk arbitrage.

D. Delta hedging.

43. An analyst has gathered the following information about ABC Inc. and DEF Inc. The respective credit ratings are AA and BBB with 1-year CDS spreads of 200 and 300 basis points each. The associated probabilities of default based on published reports are 10% and 20%, respectively. Which of the following statements about the recovery rates is most likely correct?

A. The market implied recovery rates are equal.

B. The market implied recovery rates is higher for ABC.

C. The market implied recovery rates is lower for ABC.

D. The loss given default is higher for DEF

44. The risk-free rate is 2% and a corporate bond has a yield of 3.5% per annum. It is estimated that the contribution to the spread by all non-credit factors is 40 basis points; e.g., liquidity risk. The recovery rate is 75%. What is an approximation for the implied default probability?

A. 1.9%

B. 2.5%

C. 4.4%

D. 6.0%.

45. Which of the following statements is not a problem common to the contemporary world of big data?

A. A researcher might find a strong in-sample prediction that does not produce good out-of-sample results.
B. Traditional spreadsheet analysis is not robust enough to capture relationships with multiple interactions and millions of data points.
C. Access to data is difficult.
D. The periodic presence of spurious correlations requires active variable selection.

46. Which significant enhancement was added to the 2015 CCAR that was an improvement on the 2009 SCAP testing?
A. Testing a baseline scenario and a stressed scenario.
B. Annual testing that must be approved by the Federal Reserve.
C. Testing capital ratios for minimum compliance.
D. Testing an alternate scenario that is more conservative than the baseline scenario.

47. Analyst Barry runs a short-term interest rate simulation using Model 1, which assume no drift. The time step in his model is one month. His Model 1 also makes two assumptions. First, the initial or current short-term rate is equal to 4.00%. Second, the annual basis-point volatility is 200 basis points. In the first step of his first trial, the random uniform variable is 0.8925 such that, via inverse transformation, the associated random standard normal value is 1.240. To what level does the rate evolve in the first month?
A. 3.854%
B. 4.716%
C. 5.393%
D. 6.480%

48. Large bank uses the KMV model to measure credit risk exposure. The bank has exposure to Company X. Company X's firm value, expected firm value, beta, and outstanding debt are shown below. What is the distance to default and the default point for Company X?

Current firm value	4,000
Expected firm value	5,000
Std. dev. expected firm value	500
Company X Beta	1.4
Debt 1: Short-term	1,300
Debt 2: Long-term	1,800

	Default Point	**Distance to Default**
A.	2,200	3.8
B.	3,100	5.6

C. 2,200 5.6

D. 3,100 3.8

49. ABC Corp. is attempting to compute a single hurdle rate to use for all of its business activities. The following information has been provided:

Book value of common equity	\$0.8 million
Market value of common equity	\$1.5 million
Book value of preferred equity	\$0.5 million
Market value of preferred equity	\$0.75 million
Beta of common equity	1.15
After-tax RAROC of proposed project	5%
Risk-free rate	2%
Cost of preferred equity	6%
Expected return on market portfolio	7%

Based on the information provided, which of the following statements is correct?

A. ABC's hurdle rate is 4.3%

B. ABC's hurdle rate is 7.17%

C. ABC's hurdle rate is 9.95%

D. ABC should accept the proposed project

50. Basel II/III contains capital rules for the banking industry, while Solvency II looks at the regulatory framework and quantifiable risks in the insurance industry. Comparing Solvency II and Basel II/III, which statement best characterizes the Basel II/III approach?

A. Basel II/III does not try to achieve safety for the entire company, but rather focuses on asset-specific risks (market, credit, and operational).

B. Basel II/III requires a more holistic perspective than Solvency II.

C. Basel II/III does not take in consideration pro-cyclical effects.

D. The goal of Basel II/III is to operate under no supervisory authority.

51. A risk consultant has been tasked with assessing a small bank's liquidity risk profile. While reviewing a presentation produced by the bank, the consultant comes across a list of early warning indicators used to signal potentially heightened liquidity risk. Which of the following trends should the consultant consider as the strongest warning signal for potential liquidity risk at the bank?

A. Decrease in stock price of the bank's peers but not in the stock price of the bank itself

B. Increase in credit lines received from other financial institutions

C. Widening spreads on the bank's issued debt and credit default swap

D. Significant asset growth funded by an increase in stable liabilities

52. A treasurer at a regional bank is assessing the bank's liquidity position. The treasurer estimates that the following cash inflows and outflows will occur in the next week:

Cash Flows	Amount (millions of USD)
Deposit withdrawals	50
Deposit inflows	80
Scheduled loan repayments	120
Acceptable loan requests	100
Borrowings from money market	80
Operating expenses	70
Stockholder dividend payments	40
Repayment of bank borrowings	60

Which of the following is the correct amount, at the week's end, for the bank's net liquidity position?

A. -200

B. -80

C. -40

D. 80

53. A convertible arbitrage strategy consist of taking a long position (buying) in convertible bonds that are callable by the issuer and dynamically hedging with a short position in the issuer's underlying stock. The strategy is the least exposed to which of the following?

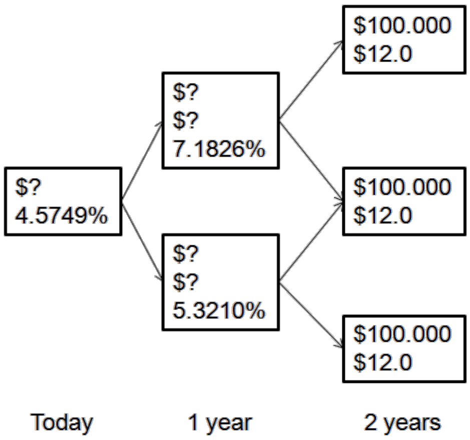
A. Stock Delta

B. Stock gamma and Vega

C. Market interest rates and credit spread

D. Negative convexity at low yields

54. The binomial interest rate tree shows as below:



The market value of an option-free, 12% annual coupon bond with two years remaining until maturity is closest to:

A. 109.927.

B. 111.485.

C. 112.282.

D. 113.394.

55. Large Bank is attempting to transition to the new Basel III standards. Specifically, they are wondering if their liquidity and funding ratios meet the updated requirements as specified by the Basel Committee. Given the following information, what is the bank's current liquidity coverage ratio?

- High-quality liquid assets $300
- Marketable securities $125
- Required amount of stable funding $250
- Cash inflows over the next 30 days $214
- Net cash outflows over the next 30 days $285
- Long-term economic capital $500
- Available amount of stable funding $255

A. 95%.

B. 105%.

C. 125%.

D. 140%.

56. Analyst Greg is employing the Merton model to both value a firm's equity and estimate a physical default probability. He has collected the following information:

- The firm's default threshold one year forward is $10 million;
- The firm current asset value is $12.75 million with an expected return of 8% per annum

with continuous compounding;

- The volatility of the firm's asset is 9.6%;
- The risk-free rate is 2%

His exercise includes two components: one, valuation of the firm's equity market value by treating equity as a call option on the firm's assets; two, estimate of physical default probability by calculation of a forward distance to default. Greg makes two assumptions:

I. An increase in the risk-free rate will increase an estimate of the firm's current equity market value, and

II. An increase in the risk-free rate will decrease the estimated default probability

Which of Greg's two assumptions is correct?

A. Neither

B. I only

C. II only

D. Both

57. Which of the following characteristics is a potential explanation for the risk anomaly?

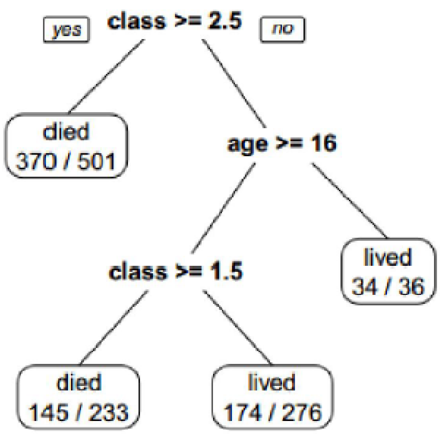
A. Investor preferences.

B. The presence of highly leveraged retail investors.

C. Lack of short selling constraints for institutional investors.

D. Lack of tracking error constraints for institutional investors.

58. Below is Hal Varian's simple classification tree that predicts Titanic survivors.



According to the tree, each of the following statements is true EXCEPT which is inaccurate?

A. This testing set contain 1,046 observations and two features

B. The tree predicts that all passengers who are younger than 16 will live

C. The rules in this tree misclassify about 30.9% of the "in sample" (testing set) observations

D. The tree predicts that all First Class passengers live, but only some Second Class passengers live

59. In a securitized structure, the collateral assets pay semiannual fixed coupons but notes issued to investors are floating-rate and paid quarterly. The SPE in a securitized structure engages into an asset swap with a support provider. The SPE pays fixed coupons to the support provider (as they are received from the collateral) and receives quarterly floating-rate coupons. The notional amount of the swap is equal to the total value of the collateral. And defaulted collateral is subtracted from the notional amount of the asset swap. Which risks are supported?

A. Liquidity and interest rate risk but not credit risk.

B. Liquidity and credit risk but not interest rate risk.

C. Credit and liquidity but not interest rate risk.

D. Credit, liquidity, and interest rate.

60. Which of the following best describes the term structure of expected liquidity, TSL(e)?

A. TLS(e) is the cumulative change in the term structure of available assets (TSAA)

B. TLS(e) is a combination of the term structures of cash flow at risk (CFaR) and liquidity at risk (LaR)

C. TLS(e) is a combination of the term structure of expected cash (TSEC), change in working capital (CIWC), and change in deposits (CID)

D. TLS(e) is a combination of the term structures of cumulative expected cash flows (TSECCF) and liquidity generation capacity (TSCLGC)

61. Each of the following is generally true about bid-ask spreads except:

A. The bid-ask spread is a measure of “tightness” and a good but basic and imperfect measure of market (asset) liquidity risk.

B. In a crash, bid-ask spreads tend to widen.

C. The bid-ask spread can incorporate both endogenous and exogenous liquidity risks.

D. A key weakness of the bid-ask spread is that it is not simple-to-implement in the VaR approach.

62. Sam prices a put option on an asset with the Black-Scholes-Merton option pricing model and calculates a model premium of \$25. This \$25 also coincidentally equals the present-valued expected exposure faced by Sam with respect to the short option position. Sam estimates the probability of counterparty default by the option writer to be 10% with loss given default of

40%, such that the expected loss = \$25 EE (writer) × 10% PD × 40% LGD = \$1. He concludes that the CVA-adjusted (net of counterparty risk) option price is \$24. His colleague Jane observes that this calculation assumes no wrong-way risk. But there is a high, positive correlation between underlying asset price and the credit quality of the option writer counterparty: both the counterparty and underlying share a sector that reacts to the same common factors such that adverse economic regimes depress sector asset prices while lowering sector credit quality (and increasing credit spreads). Is Jane correct that the CVA-adjusted option value deserves further adjustment?

A. As the correlation is positive, this is instead right-way risk; but the true CVA-adjusted value remains \$24 as there is no adjustment for right-way risk.

B. As the correlation is positive, this is instead right-way risk; therefore, the true CVA-adjusted value will be higher than \$24.

C. Jane is correct that this is wrong-way risk; therefore, true CVA-adjusted value will be lower than \$24.

D. Jane is correct that this is wrong-way risk but expected loss is not impacted by correlation, so Sam correctly has the CVA-adjusted value at \$24.

63. Due to lack of available investment opportunities in public markets, a pension fund decided to hire an investment consultant to assess the potential for investing in illiquid markets in the US. Which of the following characteristics of illiquid markets in the US should the consultant present to the pension managers?

A. Municipal bonds are usually more liquid than pinksheet over-the-counter equities

B. The traditional public, liquid markets of stocks and bonds are larger than the total wealth held in illiquid assets

C. The share of illiquid assets in institutional portfolios has generally gone up in the past 2 decades

D. During the 2008-2009 Financial Crisis, liquidity dried up in repo markets but not in commercial paper markets

64. The following three corporate bonds trade

- Bond A has a price of \$97, pays no coupon, estimated loss given default (LGD) of 50%, and matures in one year.
- Bond B has a price of \$95, a coupon rate of 1% (payable semi-annually), estimated LGD of 45%, and matures in 1.5 years.
- Bond C has price of \$96, a coupon rate of 2% (payable semi-annually), estimated LGD of 40%, and matures in 2 years.

The risk-free rate curve includes: 1% at one year; 1.5% at 1.5 years; and 2% at two years. If the only contribution to spreads is credit risk (unrealistically, non-credit factors do not contribute to the spread), which bond has the highest market-implied probability of default?

A. Bond A

B. Bond B

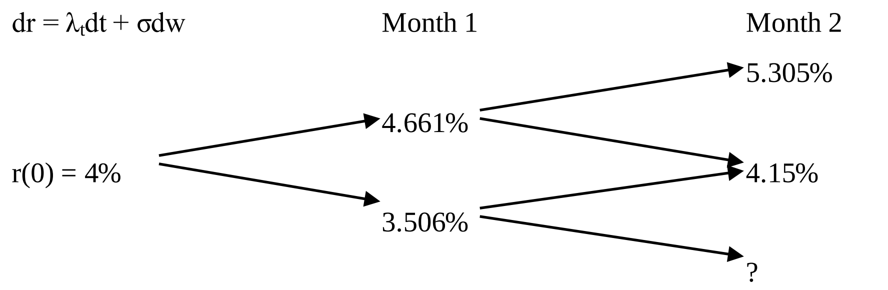
C. Bond C

D. Cannot determine

65. The current short-term rate, r(0) is 4%. Under a Ho-Lee Model with time-dependent drift, the time step is monthly and the annualized drifts are as follows: +100 basis points in the first month and +80 basis points in the second month. The annual basis point volatility is 200bps.

Ho-Lee Assumptions	
Month (dt)	0.0833
Annualized drift, first month, λ_1	100 bps
Annualized drift, second month, λ_2	80 bps
Volatility, annual	2%

Ho-Lee Model: Time-dependent drift



What is the value of the missing node [2, 0] in this Ho-Lee interest rate tree?

A. 2.447%

B. 2.677%

C. 2.995%

D. 3.256%

66. Model error was a significance cause of the substantial inaccuracy of credit rating agency models, notably the models of Moody's and standard & Poor's, in rating subprime residential mortgage-backed securities (RMBS). There's also other causes; e.g., conflicts of interest. The model errors became painfully evident in "higher-than-expected defaults rates" that began to materialize in 2007. With respect to the credit agencies' model errors in underestimated default risk of these RMBS, each of the following was a material cause except for which was the least material cause?

A. The PSA rates were too optimistic.

B. In general, the rating agency models assumed positive future house price appreciation rates.

C. These securitization products were often mapped to time series of highly rate corporate bond spread indexes.

D. Correlations among regional housing markets were assumed to be low.

67. Among these two buffers, which does Basel 3 implement to reduce procyclicality and promote the conservation of capital and the build-up of adequate buffers above the minimum that can be drawn down in periods of stress?

I. Basel 3 will phase-in a capital conservation buffer of 2.5% (of RWA) comprised of common equity Tier 1

II. Basel 3 will phase-in a countercyclical buffer of between 0% and 2.5% (of RWA) to be determined by supervisors (national authorities)

A. Neither I nor II.

B. Only I but not II

C. Only II but not I

D. Both I and II

68. Suppose the weighted average coupon on the tranches at origination was LIBOR plus 23 basis points. At the time of issue, LIBOR was 5.32%. In addition to this cost, the trust paid 51 basis points in servicing fees and initially paid 13 basis points to the swap counterparty. Finally, the weighted average interest rate on collateral at the time of issue was 8.3%. What was the initial excess spread?

A. 2.11%

B. 2.24%

C. 2.62%

D. 2.75%

69. The multilateral netting framework of a central counterparty (CCP) creates benefits and costs for market participants. Which of the following statements is not a benefit created by the CCP?

A. The loss waterfall structure provides protection in the event a CCP defaults.

B. Transparency is increased by central clearing of private information.

C. The CCP structure provides firewall protection in the event of a financial crisis.

D. Multilateral netting creates operational efficiencies through improved settlement processes.

70. A risk manager is constructing a term structure model and intends to use the Cox-Ingersoll-Ross Model. Which of the following describes this model?

A. The model presumes that the volatility of the short rate will increase at a predetermined rate.

B. The model presumes that the volatility of the short rate will decline exponentially to a constant level.

C. The model presumes that the basis-point volatility of the short rate will be proportional to the rate.

D. The model presumes that the basis-point volatility of the short rate will be proportional to the square root of the rate.

71. A portfolio manager wants to invest a small amount of new money that has recently come into a fund. The fund is benchmarked to an index and, rather than adding a new holding, the manager is considering increasing the holding of one of the four assets described in the following table:

Asset	Expected Return	Beta to the Index	Beta to the Portfolio
A	12%	1.2	0.90
B	10%	0.7	0.90
C	10%	0.6	0.85
D	8%	0.3	1.10

The portfolio manager wants to select the asset that has the lowest marginal VaR as long as its Treynor ratio is at least 0.1. Assuming the risk-free rate is 2%, which asset should the portfolio manager select?

A. Asset A

B. Asset B

C. Asset C

D. Asset D

72. A pension fund has reported that its assets and liabilities were valued at USD 840 million and USD 450 million, respectively, at the year-end 2015. The assets were fully invested in equities and commodities. The fund's liabilities, constituted entirely by fixed-income obligations, had a modified duration of 12 years. In 2016, the global slump in commodity prices affected the pension fund assets, specifically causing its investment in equities and commodities to lose 30% of their market value. However, the surprising monetary policy action of the government that led to the increase in interest rates had a positive effect on the performance of fixed-income securities, causing yields on the fund's liabilities to rise by 2.3%. What was the change in the pension fund's surplus in 2016?

A. USD -325.8 million

B. USD -127.8 million

C. USD 262.2 million

D. USD 390.0 million

73. An increase in which of the following factors will increase the no-trade region for the alpha of an asset?

I. Risk aversion.

II. Marginal contribution to active risk.

A. I only.

B. II only.

C. Both I and II.

D. Neither I nor II.

74. A risk manager is estimating the market risk of a portfolio using both the arithmetic return with normal distribution assumption and the geometric returns with lognormal distribution assumptions. The manager gathers the following data on the portfolio:

- Annualized average of arithmetic returns: 15%
- Annualized standard deviation of arithmetic returns: 35%
- Annualized average of geometric returns: 0.3%
- Annualized standard deviation of geometric returns: 44%
- Current portfolio value: EUR 4,800,000
- Trading days in a year: 252

Assuming both daily arithmetic returns and daily geometric returns are serially independent, which of the following statements is correct?

A. 1-day normal 95% VaR=4.45% and 1-day lognormal 95% VaR=3.57%

B. 1-day normal 95% VaR=3.57% and 1-day lognormal 95% VaR=4.45%

C. 1-day normal 95% VaR=4.45% and 1-day lognormal 95% VaR=4.49%

D. 1-day normal 95% VaR=3.57% and 1-day lognormal 95% VaR=3.55%

75. A risk manager is backtesting a company's 1-day 99.5% VaR model over a 10-year horizon at a 95% confidence level. Assuming 250 days in a year and the daily returns are independently and identically distributed, what is the maximum number of daily losses exceeding the 1-day 99.5% VaR in 10 years that is acceptable to conclude that the model is calibrated correctly?

A. 19

B. 25

C. 35

D. 39

76. Computing VaR on a portfolio containing a very large number of positions can be simplified by mapping these positions to a smaller number of elementary risk factors. Which of the following is the most appropriate mapping among all options?

A. USD/EUR forward contracts are mapped to the USD/EUR spot exchange rate.

B. Each position in a corporate bond portfolio is mapped to the bond with the closest maturity among a set of government bonds.

C. Zero-coupon government bonds are mapped to government bonds paying regular coupons.

D. A position in the stock market index is mapped to a position in a stock within that index.

77. A market risk manager seeks to calculate the price of a two-year zero-coupon bond. The one-year interest rate today is 10.0%. There is a 50% probability that the interest rate will be 12.0% and a 50% probability that it will be 8.0% in one year. Assuming that the risk premium of duration risk is 50 basis points each year, and that the face value is EUR 1000, which of the following should be the price of the zero-coupon bond?

A. EUR 822.98

B. EUR 826.44

C. EUR 826.72

D. EUR 921.66

78. An investment bank has been using VaR as its main risk measurement tool. ES is suggested as a better alternative to use during market turmoil. What should be understood regarding VaR and ES before modifying current practices?

A. For the same confidence level, ES is always greater than VaR.

B. If a VaR backtest at a specified confidence level is accepted, then the corresponding ES will always be accepted.

C. While VaR ensures that the estimate of portfolio risk is less than or equal to the sum of the risks of that portfolio’s positions, ES does not.

D. While ES is more complicated to calculate than VaR, it is easier to backtest than VaR.

79. A risk analyst is examining a firm’s foreign currency option price assumptions. The observed volatility smile for a particular foreign currency option slopes progressively higher as an option moves either into the money or out of the money. Compared to the lognormal distribution with the same mean and standard deviation, the distribution of option prices on

this foreign currency implied by the Black-Scholes-Merton (BSM) model would have:

A. A heavier left tail and a less heavy right tail.

B. A heavier left tail and a heavier right tail.

C. A less heavy left tail and a heavier right tail.

D. A less heavy left tail and a less heavy right tail.

80. A gold mining company has outstanding optionless zero-coupon bonds with a face value of CAD 115 million and a current market value of CAD 100 million. The company's bonds mature in 2 years. Treasury notes with a 2-year maturity have a continuously compounded yield of 4.8% per year. What is the average credit spread of the company's bonds?

A. 1.37%

B. 2.07%

C. 2.19%

D. 3.43%