Portfolio Management

共享题干题

【题干】Hiram Life (Hiram), a large multinational insurer located in Canada, has received permission to increase its ownership in an India-based life insurance company, LICIA, from 26% to 49%. Before completing this transaction, Hiram wants to complete a risk assessment of LICIA's investment portfolio. Judith Hamilton, Hiram's chief financial officer, has been asked to brief the management committee on investment risk in its India-based insurance operations.LICIA's portfolio, which has a market value of CAD 260 million, is currently structured as shown in Exhibit 1. Despite its more than 1,000 individual holdings, the portfolio is invested predominantly in India. The Indian government bond market is highly liquid, but the country's mortgage and infrastructure loan markets, as well as the corporate bond market, are relatively illiquid. Individual mortgage and corporate bond positions are large relative to the normal trading volumes in these securities. Given the elevated current and fiscal account deficits, Indian investments are also subject to above-average economic risk.Hamilton begins with a summary of the India-based portfolio. Exhibit 1 presents the current portfolio composition and the risk and return assumptions used to esti?mate value at risk (VaR).

Exhibit 1. Selected Assumptions for LICIA's Investment Portfolio

	Allocation	Average Daily Return	Daily Standard Deviation
India government securities	50%	0.015%	0.206%
India mortgage/infrastructure loans	25%	0.045%	0.710%
India corporate bonds	15%	0.025%	0.324%
India equity	10%	0.035%	0.996%

Infrastructure is a rapidly growing asset class with limited return history; the first infrastructure loans were issued just 10 years ago.Hamilton's report to the management committee must outline her assumptions and provide support for the methods she used in her risk assessment. If needed, she will also make recommendations for rebalancing the portfolio to ensure its risk profile is aligned with that of Hiram.Hamilton develops the assumptions shown in Exhibit 2, which will be used for estimating the portfolio VaR.

Exhibit 2 VaR Input Assumptions for Proposed CAD 260 Million Portfolio

Method	Average Return Assumption	Standard Deviation Assumption
Monte Carlo simulation	0.026%	0.501%
Parametric approach	0.026%	0.501%
Historical simulation	0.023%	0.490%

Hamilton elects to apply a one-day, 5% VaR limit of CAD 2 million in her risk assessment of LICIA,s portfolio. This limit is consistent with the risk tolerance the committee has specified

for the Hiram portfolio. The markets' volatility during the last 12 months has been significantly higher than the historical norm, with increased frequency of large daily losses, and Hamilton expects the next 12 months to be equally volatile. She estimates the one-day 5% portfolio VaR for LICIA's portfolio using three different approaches:

Exhibit 3 VaR Results over a One-Day Period for Proposed Portfolio

Method	5% VaR
Monte Carlo simulation	CAD 2,095,565
Parametric approach	CAD 2,083,610
Historic simulation	CAD 1,938,874

The committee is likely to have questions in a number of key areas—the limitations of the VaR report, potential losses in an extreme adverse event, and the reliability of the VaR numbers if the market continues to exhibit higher-than-normal volatility. Hamilton wants to be certain that she has thoroughly evaluated the risks inherent in the LICIA portfolio and compares them with the risks in Hiram's present portfolio. Hamilton believes the possibility of a ratings downgrade on Indian sovereign debt is high and not yet fully reflected in securities prices. If the rating is lowered, many of the portfolio's holdings will no longer meet Hiram's minimum ratings requirement. A downgrade's effect is unlikely to be limited to the government bond portfolio. All asset classes can be expected to be affected to some degree. Hamilton plans to include a scenario analysis that reflects this possibility to ensure that management has the broadest possible view of the risk exposures in the India portfolio.

1.【单项选择题】Given Hamilton's expectations, which of the following models is most appropri?ate to use in estimating portfolio VaR?

A. Parametric method

B. Historical simulation method

C. Monte Carlo simulation method

参考答案：C

【莽学解析】The Monte Carlo simulation method can accommodate virtually any distribution, an important factor given the increased frequency of large daily losses. This method can also more easily accommodate the large number of portfolio holdings. The Monte Carlo method allows the user to develop her own forward-looking assumptions about the portfolio's risk and return char?acteristics, unlike the historical simulation method, which uses the current portfolio and re-prices it using the actual historical changes in the key factors experienced during the look-back period. Given the limited return history for infrastructure investments and Hamilton's expectations for higher-than-normal volatility, the historical simulation method would be a suboptimal choice.

2.【单项选择题】Which risk measure is Hamilton most likely to present when addressing the committee's concerns regarding potential losses in extreme stress events?

A. Relative VaR

B. Incremental VaR

C. Conditional VaR

参考答案：C

【莽学解析】Conditional VaR is a measure of tail risk that provides an estimate of the average loss that would be incurred if the VaR cutoff is exceeded.

3.【单项选择题】The scenario analysis that Hamilton prepares for the committee is most likely a:

A. stress test.

B. historical scenario.

C. hypothetical scenario.

参考答案：C

【莽学解析】A hypothetical scenario analysis allows the risk manager to estimate the likely effect of the scenario on a range of portfolio risk factors. A sovereign ratings downgrade would affect Hiram's India equity and corporate bond exposures as well as the government bond exposure. In addition, the assumptions used in constructing the scenario analysis can specifically address the effect of a need to sell large position sizes under decreased liquidity condi?tions resulting from a ratings downgrade. VaR alone does not accurately reflect the risk of large position sizes, which may be difficult to trade.

4.【单项选择题】The scenario analysis that Hamilton prepares for the committee is a valuable tool to supplement VaR because it:

A. incorporates historical data to evaluate the risk in the tail of the VaR distribution.

B. enables Hamilton to isolate the risk stemming from a single risk factor—the ratings downgrade.

C. allows the committee to assess the effect of low liquidity in the event of a ratings downgrade.

参考答案：C

【莽学解析】A hypothetical scenario analysis allows Hamilton to estimate the direct effect of a ratings downgrade on the portfolio's government bond holdings and the resulting need to sell a number of the portfolio's holdings because they no longer meet the ratings guidelines. VaR alone does not accu?rately reflect the risk of large position sizes, which may be difficult to trade. The hypothetical scenario analysis will also highlight the effect of increased eco?nomic turmoil on all of the portfolio's exposures, not only the government bond exposures.

5.【单项选择题】Using the data in Exhibit 2, the portfolio's annual 1% parametric VaR is closest to:

A. CAD 17 million.

B. CAD 31 million.

C. CAD 48 million.

参考答案：B

【莽学解析】

6.【单项选择题】What additional risk measures would be most appropriate to add to Hamilton's risk assessment?

A. Delta

B. Duration

The VaR is derived as follows:

$$VaR = [(E(R_p) - 2.33\sigma_p)(-1)](Portfolio\ value)$$

where

$$E(R_p) = Annualized\ daily\ return = (0.00026 \times 250) = 0.065$$

$$250 = Number\ of\ trading\ days\ annually$$

$$2.33 = Number\ of\ standard\ deviations\ to\ attain\ 1\%\ VaR$$

$$\sigma_p = Annualized\ standard\ deviation = (0.00501 \times \sqrt{250}) = 0.079215$$

$$Portfolio\ value = CAD\ 260{,}000{,}000$$

$$VaR = -(0.065 - 0.184571) \times CAD\ 260{,}000{,}000 = CAD31{,}088{,}460$$

C. Tracking error

参考答案：B

【莽学解析】Given the large fixed-income exposure in the LICIA portfolio, examining the portfolio duration more closely would be prudent. Duration is the primary sensitivity exposure measure for fixed-income investments.

【题干】John Martinez is assessing the performance of the actively managed diversified asset portfolio. The diversified asset portfolio is invested in equities, bonds, and real estate, and allocations to these asset classes and to the holdings within them are unconstrained. Selected return and financial data for the portfolio for 2019 are presented in Exhibit 1.

Exhibit 1 Diversified Asset Portfolio 2019 Portfol

	Sub-Portfolio Return (%)	Benchmark Return (%)	P Allo
Equities sub-portfolio	36.9	31.6	
Bond sub-portfolio	−2.4	−2.6	
Real estate sub-portfolio	33.4	28.3	

Martinez uses several risk-adjusted return metrics to assess the performance of the diversified asset portfolio, including the information ratio and the Sharpe ratio. Selected risk, return, and statistical data for the portfolio are presented in Exhibit 2.

Exhibit 2 Diversified Asset Portfolio Data, 2000-2

	Transfer Coefficient (TC)	Informatio Coefficient
Equities sub-portfolio	0.90	0.091
Bond sub-portfolio	0.79	0.087
Real estate sub-portfolio	0.86	0.093

Martinez has recently hired Kenneth Singh to help him evaluate portfolios. Martinez asks Singh about the possible effects on the portfolio's information ratio if cash were added to the diversified asset portfolio or if the aggressiveness of the portfolio's active weights were increased. Singh responds with two statements:Statement 1: Adding cash to the portfolio would change the portfolio's information ratio.Statement 2: Increasing the aggressiveness of active weights would not change the portfolio's information ratio.

7.【单项选择题】Based on Exhibit 1, the value added to the diversified asset portfolio attributable to the security selection decision in 2019 was closest to:

A.2.3%.

B.3.9%.

C.6.1%.

参考答案：B

【莽学解析】Based on the differences in returns for the portfolio and benchmark in Exhibit 1, the value added by each asset class within the portfolio is shown in the following table: The value added from security selection is calculated as the sum of the actual portfolio weights multiplied by each sub-portfolio's value added measure. Thus, the value added from security selection is calculated as: Value added from security selection = 0.63(5.3%) 0.28(0.2%) 0.09(5.1%) = 3.9%.

A is incorrect. It represents the value added from asset allocation (2.3%).

C is incorrect. It represents the total value added (2.3% 3.9% = 6.1%, with rounding).

	Sub-Portfolio Return (%)	Benchmark Return (%)	Value Added (%)	Por Allo
Equities sub-portfolio	36.9	31.6	5.3	
Bond sub-portfolio	−2.4	−2.6	0.2	
Real estate sub-portfolio	33.4	28.3	5.1	

8.【单项选择题】Based on Exhibit 1, the value added of the diversified asset portfolio attributable to the asset allocation decision in 2019 was closest to:

A. 2.3%.

B. 3.9%.

C. 6.1%.

参考答案：A

【莽学解析】The value added from asset allocation is calculated as the sum of the differences in the weights between the strategic (benchmark) allocation and the actual subportfolio allocation multiplied by each subportfolio's benchmark return.

	Benchmark Return (%)	Actual Asset Allocation (%)	Strategic Asset Allocation (%)	Actual - Strategic Asset Allocation (%)
Equities subportfolio	31.6	63	60	+3
Bond subportfolio	−2.6	28	35	−7
Real estate subportfolio	28.3	9	5	+4

Thus, the value added by the active asset allocation decision is calculated as:Value added from asset allocation decision = 0.03(31.6%) - 0.07(-2.6%) 0.04(28.3%) = 2.3%.B is incorrect. It is the value added from security selection.C is incorrect. It is the total value added.

9.【单项选择题】Based on data in Exhibit 2 and using the information ratio as the criterion for

evaluating performance, which sub-portfolio had the best performance in the period 2000－2019?

A. The bond subportfolio.

B. The equities subportfolio.

C. The real estate subportfolio.

参考答案：B

【莽学解析】The information ratio for a portfolio can be expressed as follows:

$$IR = (TC)(IC)\sqrt{BR}$$

The information ratios for the three subportfolios are calculated as follows:

	Information Ratio
Equities subportfolio	$0.90 \times 0.091 \times (21)^{0.5} = 0.38$
Bond subportfolio	$0.79 \times 0.087 \times (23)^{0.5} = 0.33$
Real estate subportfolio	$0.86 \times 0.093 \times (19)^{0.5} = 0.35$

Based on the information ratio, the equities subportfolio outperformed the real estate subportfolio. The information ratio for the equities subportfolio of 0.38 was higher than the information ratio for the real estate subportfolio of 0.35 and the bond subportfolio of 0.33.

10.【单项选择题】Which of Singh's statements regarding the information ratio is correct?

A. Only Statement 1

B. Only Statement 2

C. Both Statement 1 and Statement 2

参考答案：C

【莽学解析】The information ratio for a portfolio of risky assets will generally shrink if cash is added to the portfolio. Because the diversified asset portfolio is an unconstrained portfolio, its information ratio would be unaffected by an increase in the aggressiveness of active weights.

【题干】Randy Gorver, chief risk officer at Eastern Regional Bank, and John Abell, assistant risk officer, are currently conducting a risk assessment of several of the bank's independent investment functions. These reviews include the bank's fixed-income investment portfolio and an equity fund managed by the bank's trust department. Gorver and Abell are also assessing Eastern Regional's overall risk exposure.Eastern Regional Bank Fixed-Income Investment PortfolioThe bank's proprietary fixed-income portfolio is structured as a barbell portfolio: About half of the portfolio is invested in zero-coupon Treasuries with maturities in the 3- to 5-year range (Portfolio P

1

), and the remainder is invested in zero-coupon Treasuries with maturities in the 10- to 15-year range (Portfolio P

2

. Georges Montes, the portfolio manager, has discretion to allocate between 40% and 60% of the assets to each maturity "bucket" He must remain fully invested at all times. Exhibit 1 shows

details of this portfolio.

Exhibit 1. US Treasury Barbell Portfolio

	Maturity	
	P_1	P_2
	3-5 Years	10-15 Years
Average duration	3.30	11.07
Average yield to maturity	1.45%	2.23%
Market value	$50.3 million	$58.7 million

Trust Department's Equity Funda) Use of Options: The trust department of Eastern Regional Bank manages an equity fund called the Index Plus Fund, with $325 million in assets. This fund's objective is to track the S&P 500 Index price return while producing an income return 1.5 times that of the S&P 500. The bank's chief investment officer (CIO) uses put and call options on S&P 500 stock index futures to adjust the risk exposure of certain client accounts that have an investment in this fund. The portfolio of a 60-year-old widow with a below-average risk tolerance has an investment in this fund, and the CIO has asked his assistant, Janet Ferrell, to propose an options strategy to bring the portfolio's delta to 0.90.b) Value at Risk: The Index Plus Fund has a one-day 95% value at risk (VaR) of $6.5 million. Gorver asks Abell to write a brief summary of the portfolio VaR for the report he is preparing on the fund's risk position.

Combined Bank Risk ExposuresThe bank has adopted a new risk policy, which requires forward-looking risk assessments in addition to the measures that look at historical risk characteristics. Management has also become very focused on tail risk since the subprime crisis and is evaluating the bank's capital allocation to certain higher-risk lines of business. Gorver must determine what additional risk metrics to include in his risk reporting to address the new policy. He asks Abell to draft a section of the risk report that will address the risk measures' adequacy for capital allocation decisions.

11.【单项选择题】If Montes is expecting a 50 bps increase in yields at all points along the yield curve, which of the following trades is he most likely to execute to minimize his risk?

A. Sell $35 million of P_2 and reinvest the proceeds in three-year bonds

B. Sell $15 million of P_2 and reinvest the proceeds in three-year bonds.

C. Reduce the duration of P_2 to 10 years and reduce the duration of P_1 to 3 years

参考答案：B

【莽学解析】Duration is a measure of interest rate risk. To reduce risk in anticipation of an increase in interest rates, Montes would seek to shorten the portfolio's duration. He is limited, however, in the amount he can shift from P_2 to P_1. Selling $15 million of P_2 reduces that portfolio to the lower end of the permitted 40% to 60% range. By reinvesting the proceeds at the shortest matur?ities allowed, Montes substantially reduces the portfolio duration.

12.【单项选择题】Which of the following options strategies is Ferrell most likely to recommend for the client's portfolio?

A. Long calls
B. Short calls
C. Short puts
参考答案：B
【莽学解析】An index-tracking portfolio without options has a delta of 1. To achieve a delta of 0.9, the delta of the options position must be negative. Of the three choices, only short calls have a negative delta. Long call options have deltas ranging from 0 to 1. Short calls, therefore, have deltas ranging from 0 to -1. The short call position lowers the portfolio's overall delta as desired.

13.【单项选择题】Which of the following statements regarding the VaR of the Index Plus Fund is correct?
A. The expected maximum loss for the portfolio is $6.5 million.
B. Five percent of the time, the portfolio can be expected to experience a loss of at least $6.5 million.
C. Ninety-five percent of the time, the portfolio can be expected to experience a one-day loss of no more than $6.5 million.
参考答案：B
【莽学解析】VaR measures the frequency of losses of a given minimum magnitude. Here the VaR indicates that on 5% of trading days, the portfolio will experience a loss of at least $6.5 million. (Although C may appear to say the same thing as B, it actually implies that the portfolio will experience a loss on 95% of trading days.) The correct interpretation is that returns will be equal to or greater than -$6.5 million on 95% of trading days; those returns include gains as well as losses.

14.【单项选择题】To comply with the new bank policy on risk assessment, which of the following is the best set of risk measures to add to the chief risk officer's risk reporting?
A. Conditional VaR, stress test, and scenario analysis
B. Monte Carlo VaR, incremental VaR, and stress test
C. Parametric VaR, marginal VaR, and scenario analysis
参考答案：A
【莽学解析】The bank policy requires the addition of forward-looking risk assessments, and management is focused on tail risk. Conditional VaR measures tail risk, and stress tests and scenario analysis subject current portfolio holdings to historical or hypothetical stress events.

15.【单项选择题】Which of the following statements should not be included in Abell's report to management regarding the use of risk measures in capital allocation decisions?
A. VaR measures capture the increased liquidity risk during stress periods.
B. Stress tests and scenario analysis can be used to evaluate the effect of outlier events on each line of business.
C. VaR approaches that can accommodate a non-normal distribution are criti?cal to understand relative risk across lines of business.
参考答案：A
【莽学解析】VaR measures do not capture liquidity risk. "If some assets in a portfolio are relatively illiquid, VaR could be understated, even under normal market conditions.

Additionally, liquidity squeezes are frequently associated with tail events and major market downturns, thereby exacerbating the risk"

【题干】Julie Carlisle is a financial planner at a large wealth management firm. One of her clients, Esteban Blake, just received a sizable inheritance. He invests a portion of the inheritance in an annuity that will immediately increase his income by a substantial amount. He enlists Carlisle's help to invest the remaining amount of the inheritance.Blake informs Carlisle he would like some short-term bonds in his portfolio. Carlisle proposes purchasing a one-year domestic government zero-coupon bond. It has a face value of $100 and is currently priced at $96.37. Carlisle estimates the one-year real risk-free rate at 1.15% and expects inflation over the next year to be 2.25%.In an effort to provide Blake with some exposure to international markets, Carlisle proposes three countries to look for investment opportunities. Selected data on the three countries are presented in Exhibit 1.

Exhibit 1. Selected Macroeconomic Data

	Nominal GDP Growth	Inflation Rate	Volatility of Real GDP Growth	Yield Curve Shape	Trailing 12-Month Equity Index P/E
Country#1	6.5%	4.0%		Flat	16.5
Country#2	5.0%	2.5%	High	Upward slope	17.3
Country#3	3.5%	2.0%	Low	Flat	18.2

In her analysis, Carlisle observes that the spread between the three-year default- free nominal bond and the default-free real zero-coupon bond in Country #3 is 2.0%.Blake expresses concern that stocks may be currently overvalued in Country #3 given the country's 20-year historical equity index P/E of 16.0. Carlisle comments:I think the equilibrium P/E in Country #3 has increased because of changes in market conditions.Carlisle predicts that Country #3 will slip into a recession next quarter. She thinks it will be short-lived, lasting only 12 months or so, and considers the impact of such a recession on the performance of the country's stocks and bonds.

Exhibit 2. Three-Year Corporate Bonds from Country #3

Corporate Bond	Moody's Investors Service Rating	Spread*
Bond A	Aaa	1.4%
Bond B	Baa1	3.2%
Bond C	B3	5.3%

* Spread versus three-year sovereign bond

16.【单项选择题】Holding all else constant, the change in Blake's income will most likely result in:

A. an increase in his marginal utility of consumption.
B. an increase in his intertemporal rate of substitution.
C. a decrease in his required risk premium for investing in risky assets.
参考答案：C
【莽学解析】The additional annuity payment substantially increases Blake's income and wealth, which decreases his marginal utility of consumption. As a result, the average loss of marginal utility from any risk taking decreases as his wealth increases. Thus, he requires a lower risk premium and is willing to buy more risky assets.

17.【单项选择题】The implied premium for inflation uncertainty for the one-year government zero-coupon bond proposed by Carlisle is closest to:
A. 0.23%.
B. 0.37%.
C. 1.10%.
参考答案：B
【莽学解析】The pricing equation for a default-free nominal coupon-paying bond is

$$P_t^i = \sum_{s=1}^{N} \frac{CF_{t+s}^i}{(1+l_{t,s}+\theta_{t,s}+\pi_{t,s})}$$

For a one-year bond, the pricing formula reduces to

$$P_t = \frac{CF_{t+1}}{(1+l_{t,1}+\theta_{t,1}+\pi_{t,1})^1}$$

Thus, the implied premium for inflation uncertainty for one-year government zero-coupon bond is calculated as

$$\pi_{t,1} = \frac{CF_{t+1}}{P_t} - (1+l_{t,1}+\theta_{t,1}) = 100/96.37 - (1+0.0115+0.0225) = 1.0377 - 1.0340 = 0.0037, \text{ or } 0.37\%$$

18.【单项选择题】Based on the data in Exhibit 1, current real short-term interest rates would most likely be highest in:
A. Country #1
B. Country #2
C. Country #3
参考答案：B
【莽学解析】Real short-term interest rates are positively related to both real GDP growth and the volatility of real GDP growth. Country #1 and Country #2 have the highest real GDP growth, as estimated by the difference between nominal GDP growth and average inflation (6.5% - 4.0% = 2.5% and 5.0% - 2.5% = 2.5%, respectively), while Country #3 has the lowest real GDP growth (3.5% - 2.0% = 1.5%). Looking at the volatility of real GDP growth, Country #2 has high real GDP growth volatility, whereas Country #1 and Country #3 have low real GDP growth volatility.

Therefore, Country #2 would most likely have the highest real short-term interest rates.

19.【单项选择题】The recent change in Country #3's breakeven inflation rate suggests that the expected rate of inflation over the next three years is:

A. less than 2.0%.

B. equal to 2.0%.

C. greater than 2.0%.

参考答案：A

【莽学解析】The difference, or spread, between the yields on the country's three-year default-free nominal and on the default-free real zero-coupon bonds is 2.0%. This spread is known as the breakeven rate of inflation (BEI), which is composed of the expected rate of inflation plus a risk premium for the uncertainty of future inflation. Because this risk premium component is most likely positive, because investors are unlikely to be very confident in their ability to predict inflation accurately, the expected rate of inflation component would be less than 2.0%.

20.【单项选择题】Which of the following changes in market conditions best supports Carlisle's comment regarding the equilibrium P/E for Country #3?

A. An increase in the equity risk premium

B. A decrease in uncertainty about future inflation

C. A decrease in expectation of future real earnings growth

参考答案：B

【莽学解析】Stock prices are a function of expected cash flows discounted by inflation expectations, the uncertainty of future inflation, and the equity risk premium, among other factors. Holding all else equal, a decline in the uncertainty of future inflation would result in lower discount rates and higher valuations. This result would support a higher equilibrium P/E, thus justifying Country #3's current trailing P/E being higher than its historical average.

21.【单项选择题】If Carlisle's prediction about the economy of Country #3 is realized, the yield curve in Country #3 will most likely:

A. remain flat.

B. become upward sloping.

C. become downward sloping.

参考答案：B

【莽学解析】The yield curve in Country #3 is currently flat (Exhibit 1), and Carlisle predicts a recession. During a recession, short-term rates tend to be lower because central banks tend to lower their policy rate in these times. However, the impact of monetary policy on longer term rates will not be as strong because the central bank will usually be expected to bring short-term rates back to normal as the recession recedes. Thus, the slope of the yield curve will likely become upward sloping during the recession.

22.【单项选择题】Based on Exhibit 2, if Carlisle's prediction for Country #3 is realized, then over the next 12 months:

A. Bond A would be expected to outperform Bond C.

B. Bond B would be expected to outperform Bond A.

C. Bond C would be expected to outperform Bond B.

参考答案：A

【莽学解析】If Country #3 experiences a recession over the next 12 months, the credit spreads for corporate bonds would be expected to widen as investors sell the low-quality debt of issuers with high default risk and trade up to the higher-quality debt of issuers with low default risk. The issuers with a good credit rating (like Aaa rated Bond A) tend to outperform those with lower ratings (like B3 rated Bond C) as the spread between low and higher quality issuers widens. As a result, Bond A would be expected to outperform Bond C over the next 12 months.

【题干】Carlos Altuve is a manager-of-managers at an investment company that uses quantitative models extensively. Altuve seeks to construct a multi-manager portfolio using some of the funds managed by portfolio managers within the firm. Maya Zapata is assisting him.Altuve uses arbitrage pricing theory (APT) as a basis for evaluating strategies and managing risks. From his earlier analysis, Zapata knows that Funds A and B in Exhibit 1 are well diversified. He has not previously worked with Fund C and is puzzled by the data because it is inconsistent with APT. He asks Zapata gather additional information on Fund C's holdings and to determine if an arbitrage opportunity exists among these three investment alternatives. Her analysis, using the data in Exhibit 1, confirms that an arbitrage opportunity does exist.

Exhibit 1. Expected Returns and Factor Sensitivities (One-Factor Model)

Fund	Expected Return	Factor Sensitivity
A	0.02	0.5
B	0.04	1.5
C	0.03	0.9

The manager of Fund C makes some modifications to his portfolio and eliminates the arbitrage opportunity. Using a two-factor model, Zapata now estimates the three funds' sensitivity to inflation and GDP growth. That information is presented in Exhibit 2. Zapata assumes a zero value for the error terms when working with the selected two-factor model.

Exhibit 2. Expected Returns and Factor Sensitivities (Two-Factor Model)

Fund	Expected Return	Factor Sensitivity	
		Inflation	GDP Growth
A	0.02	0.5	1.0
B	0.04	1.6	0.0
C	0.03	1.0	1.1

Altuve asks Zapata to calculate the return for Portfolio AC, composed of a 60% allocation to Fund A and 40% allocation to Fund C, using the surprises in inflation and GDP growth in Exhibit

3.

Exhibit 3. Selected Data on Factors		
Factor	Research Staff Forecast	Actual Value
Inflation	2.0%	2.2%
GDP Growth	1.5%	1.0%

Finally, Altuve asks Zapata about the return sensitivities of Portfolios A, B, and C given the information provided in Exhibit 3.

23.【单项选择题】Which of the following is not a key assumption of APT, which is used by Altuve to evaluate strategies and manage risks?

A. A factor model describes asset returns.

B. Asset-specific risk can be eliminated through diversification.

C. Arbitrage opportunities exist among well-diversified portfolios.

参考答案：C

【莽学解析】Arbitrage pricing theory (APT) is a framework that explains the expected return of a portfolio in equilibrium as a linear function of the risk of the portfolio with respect to set of a factors capturing systematic risk. A key assumption of APT is that, in equilibrium, there are no arbitrage opportunities.

24.【单项选择题】The arbitrage opportunity identified by Zapata can be exploited with:

A. Strategy 1: Buy $50,000 Fund A and $50,000 Fund B; sell short $100,000 Fund C.

B. Strategy 2: Buy $60,000 Fund A and $40,000 Fund B; sell short $100,000 Fund C.

C. Strategy 3: Sell short $60,000 of Fund A and $40,000 of Fund B; buy $100,000 Fund C

参考答案：C

【莽学解析】The expected return and factor sensitivities of a portfolio with a 60% weight in Fund A and a 40% weight in Fund B are calculated as weighted averages of the expected returns and factor sensitivities of Funds A and B:Expected return of Portfolio 60/40 = (0.60)*(0.02) (0.40)*(0.04) = 0.028, or 2.8%Factor sensitivity of Portfolio 60/40 = (0.60)*(0.5) (0.40)*(1.5) = 0.9

The factor sensitivity of Portfolio 60/40 is identical to that of Fund C; therefore, this strategy results in no factor risk relative to Portfolio C. However, Fund C's expected return of 3.0% is higher than Portfolio 60/40's expected return of 2.8%. This difference supports Strategy 3: buying Fund C and selling short Portfolio 60/40 to exploit the arbitrage opportunity.

25.【单项选择题】The two-factor model Zapata uses is a:

A. statistical factor model.

B. fundamental factor model.

C. macroeconomic factor model.

参考答案：C

Fund	Expected Return	Factor Sensitivity
A	0.02	0.5
B	0.04	1.5
C	0.03	0.9
Portfolio 60/40		
60%A+40%B	0.028	0.900
Portfolio 50/50		
50%A+50%B	0.030	1.000

【莽学解析】In a macroeconomic factor model, the factors are surprises in macroeconomic variables, such as inflation risk and GDP growth, that significantly explain returns.

26.【单项选择题】Based on the data in Exhibits 2 and 3, the return for Portfolio AC, given the surprises in inflation and GDP growth, is closest to:

A. 2.02%

B. 2.40%

C. 4.98%

参考答案：A

【莽学解析】The macroeconomic two-factor model takes the following form:

$$R_i = a_i + b_{i1}F_{INF} + b_{i2}F_{GDP} + \varepsilon_i$$

where FINF and FGDP represent surprises in inflation and surprises in GDP growth, respectively, and ai represents the expected return to asset i. Using this model and the data in Exhibit 2, the returns for Fund A and Fund C are represented by the following:

$$R_A = 0.02 + 0.5F_{INF} + 1.0F_{GDP} + \varepsilon_A$$

$$R_C = 0.03 + 1.0F_{INF} + 1.1F_{GDP} + \varepsilon_C$$

Surprise in a macroeconomic model is defined as actual factor minus predicted factor. The surprise in inflation is 0.2% (= 2.2%-2.0%). 1he surprise in GDP growth is -0.5% (= 1.0%-1.5%).The return for Portfolio AC, composed of a 60% allocation to Fund A and 40% allocation to Fund C, is calculated as the following:

$$R_{AC} = (0.6)(0.02) + (0.4)(0.03) + [(0.6)(0.5) + (0.4)(1.0)](0.002) + [(0.6)(1.0) + (0.4)(1.1)](-0.005) + 0.6(0) + 0.4(0) = 2.02\%$$

27.【单项选择题】The surprise in which of the following had the greatest effect on fund returns?

A. Inflation on Fund B
B. GDP growth on Fund A
C. GDP growth on Fund C
参考答案：C
【莽学解析】Surprise in a macroeconomic model is defined as actual factor minus predicted factor. For inflation, the surprise factor is 2.2% - 2.0% = 0.2%; for GDP growth, the surprise factor is 1.0% - 1.5% = - 0.5%. The effect on returns is the product of the surprise and the factor sensitivity.

Fund	Change in Portfolio Return due to Surprise in	
	Inflation	GDP Growth
A	0.5 × 0.2% = 0.10%	1.0 × -0.5% = -0.50%
B	1.6 × 0.2% = 0.32%	0.0 × -0.5% = 0.00%
C	1.0 × 0.2% = .20%	1.1 × -0.5% = -0.55%

The effect of the GDP growth surprise on Fund C was the largest single-factor effect on Fund returns (-0.55%).

28.【单项选择题】Based on the data in Exhibit 2, which fund is most sensitive to the combined surprises in inflation and GDP growth in Exhibit 3?
A. Fund A
B. Fund B
C. Fund C
参考答案：A
【莽学解析】The effect of the surprises in inflation and GDP growth on the returns of the three funds is calculated as the following.

Fund	Change in Portfolio Return due to Surprise in	
	Inflation	GDP Growth
A	0.5 × 0.2% = 0.10%	1.0 × -0.5% = -0.50%
B	1.6 × 0.2% = 0.32%	0.0 × -0.5% = 0.00%
C	1.0 × 0.2% = .20%	1.1 × -0.5% = -0.55%

The combined effects for the three funds are the following. Fund A: 0.10% (-0.50%) = -0.40%Fund B: 0.32% (0.00%) = 0.32%Fund C: 0.20% (-0.55%) = -0.35%Therefore, Fund A is the most sensitive to the surprises in inflation and GDP growth in Exhibit 3.

【题干】Kata Rom is an equity analyst working for Gimingham Wealth Partners (GWP), a large investment advisory company. Rom meets with Goran Galic, a Canadian private wealth client, to

explain investment strategies used by GWP to generate portfolio alpha for its clients.
Rom states that GWP is recognized in the Canadian investment industry as a leading factor-based value portfolio manager and describes how GWP creates relevant investment strategies and explains GWP's backtesting process. Rom notes the following:
Statement 1: Using historical data, backtesting approximates a real-life investment process to illustrate the risk–return tradeoff of a particular proposed investment strategy.
Statement 2: Backtesting is used almost exclusively by quantitative investment managers and rarely by fundamental investment managers, who are more concerned with information such as forward estimates of company earnings, macroeconomic factors, and intrinsic values.
Galic, who is 62 years old, decides to allocate C$2 million (representing 10% of his net worth) to an account with GWP and stipulates that portfolio assets be restricted exclusively to domestic securities. Although GWP has not backtested its strategies with such a restriction, it has backtested its strategies using a global index that includes domestic securities. Rom shows the following risk measures to Galic for three factor portfolios.

Exhibit 1 Downside Risk Measures for Model Fac

Risk Measure	Factor 1	Factor
Value at risk (VaR) (95%)	(6.49%)	(0.77%
Conditional VaR (CVaR) (95%)	(15.73%)	(4.21%
Maximum drawdown	35.10%	38.83%

Galic asks Rom, "What happens if the future is different from the past?" Rom gives the following replies:
Statement 3: Although backtesting can offer some comfort, you are correct that it does have a weakness: Backtesting generally does not capture the dynamic nature of financial markets and in particular may not capture extreme downside risk.
Statement 4: As a result, we have captured extreme downside risk and the dynamic nature of financial markets by using the Value-at-Risk and Conditional Value-at- Risk measures.
In an effort to make Galic fully aware of the risks inherent in GWP's strategies, Rom describes a recent study that investigated the return distributions of value and momentum factors that GWP uses to construct portfolios. The study found that these distributions were non-normal based on their negative skewness, excess kurtosis, and tail dependence. Rom indicated that investment strategies based on this type of data are prone to significantly higher downside risk. Rom informs Galic that GWP also uses a technique commonly referred to as scenario analysis to examine how strategies perform in different structural regimes. Exhibit 2

compares the performance of two of GWP's factor allocation strategies in different regimes:

Exhibit 2 Scenario Analysis Using the Sharpe Rat

Strategy/Regime	High Volatility	Low Volatility
Strategy I	0.88	0.64
Strategy II	1.56	1.60

Galic is surprised to see that some of the backtest results are unfavorable. He asks, "Why has GWP not considered strategies that perform better in backtesting?" Galic recently met with Fastlane Wealth Managers, who showed much better performance results. The portfolio manager at Fastlane told Galic that the company selects the top-performing strategies after performing thousands of backtests.

29.【单项选择题】Which of Rom's statements concerning backtesting is correct?

A. Only Statement 1

B. Only Statement 2

C. Both Statement 1 and Statement 2

参考答案：A

【莽学解析】Statement 1 is correct because the main objective of backtesting is to understand the risk-return tradeoff of an investment strategy by approximating the real-life investment process.

B is incorrect because Statement 2 is inaccurate. Although backtesting fits quantitative and systematic investment styles more naturally, it has also been heavily used by fundamental managers. C is incorrect because Statement 2 is not accurate. Backtesting, used in quantitative and systematic investment styles, is also heavily used by fundamental managers.

30.【单项选择题】Which key parameter needs to be changed for a new backtest that includes Galic's restrictions?

A. Start and end dates.

B. Consideration of transaction costs.

C. Investment universe.

参考答案：C

【莽学解析】Investment universe represents the securities in which a strategy can potentially invest. Galic's restriction to exclusively own domestic securities means the investment universe of a backtest for a strategy for Galic's account should use a domestic rather than global investment universe.

A is incorrect. Galic's restriction to domestic securities does not affect the start and end dates for a backtest.
B is incorrect. Galic's restriction to domestic securities does not change the inclusion of transaction costs in the study.

31.【单项选择题】Galic's concern embedded in the question "What happens if the future is different from the past?" is a problem most relevant for which investment strategy evaluation technique?
A. Sensitivity analysis.
B. Backtesting.
C. Monte Carlo simulation.
参考答案：B
【莽学解析】An implicit assumption of backtesting is that past returns are a guide to future asset returns.
A is incorrect. Sensitivity analysis refers to modifying assumptions such as probability distributions of key variables in a Monte Carlo simulation, which is a non-deterministic evaluation technique that does not use historical data.
C is incorrect. Monte Carlo simulation is a non-deterministic evaluation technique that does not use historical data.

32.【单项选择题】Which of the following conclusions of Exhibit 1 is least likely to be true?
A. 5% of the time, losses from Factor 1 would be at least 6.49%.
B. When the VaR is exceeded in Factor 1, we should expect an average loss of 15.73%.
C. 5% of the time, losses from Factor 2 are likely to be worse than losses from Factor 1.
参考答案：C
【莽学解析】The VaR metrics in Exhibit 1 show that 5% of the time, losses will be at least 6.49% and 0.77%, respectively, for Factor 1 and Factor 2. The CvaR metrics in Exhibit 1 show that the weighted average of all loss outcomes that exceed the VaR loss are 15.73% and 4.21% for Factor 1 and Factor 2, respectively. Thus, A is true because it correctly defines VaR, and B is true because it correctly defines CVaR, whereas C is untrue because both VaR and CVaR are lower for Factor 2 than Factor 1.

33.【单项选择题】Based on the statistical study performed by GWP, which of the following represents a suggested course of action if GWP were to conduct Monte Carlo simulation analyses on the factor strategies?
A. Inverse transformation.
B. Bootstrapping.
C. Sensitivity analysis.
参考答案：C
【莽学解析】Performing sensitivity analysis represents best practice given these characteristics, because the user could test different probability distributions that relax the assumptions of the normal distribution, for example.
A is incorrect. Inverse transformation is a method of random observation generation, often used in simulation.
B is incorrect. Bootstrapping refers to random sampling with replacement, often used in historical simulation.

34.【单项选择题】Based on Exhibit 1, which factor has the smallest downside risk as measured by the weighted average of all losses that exceed a threshold?
A. Factor 1
B. Factor 2
C. Factor 3
参考答案：C
【莽学解析】Exhibit 1 presents three downside risk measures: VaR, CVaR, and maximum drawdown. Conditional VaR is defined as the weighted average of all loss outcomes in the return distribution that exceed the VaR loss. Thus, CvaR is a more comprehensive measure of tail loss than VaR. Based on Exhibit 1, the factor with the smallest downside risk based on CVaR is Factor 3.

35.【单项选择题】The approach used by Fastlane Wealth Managers most likely incorporates:
A. risk parity.
B. data snooping.
C. cross-validation.
参考答案：B
【莽学解析】The fact that the two firms' investment performance results differ over similar time horizons using the same data and factors may be the result of selection bias. Data snooping is a type of selection bias. Fastlane Wealth Managers is most likely selecting the best-performing modeling approach and publishing its results (i.e., data snooping).
A is incorrect because risk parity is a portfolio construction technique that accounts for the volatility of each factor and the correlations of returns among all factors to be combined in the portfolio. It is not regarded as selection bias.
C is incorrect because cross-validation is a technique used in the machine learning field, as well as in backtesting investment strategies, to partition data for model training and testing. It is not considered selection bias.

36.【单项选择题】Comparing the two strategies in Exhibit 2, the best risk-adjusted performance is demonstrated by:
A. Strategy II in periods of low volatility and recession.
B. Strategy I in periods of high volatility and non-recession.
C. Strategy II in periods of high volatility and non-recession.
参考答案：A
【莽学解析】Using the Sharpe ratio, the best risk-adjusted relative performance can be determined by comparing the sensitivity of the two strategies under differing macroeconomic regimes: recession versus non-recession and high volatility versus low volatility. The best risk-adjusted return will exhibit the highest Sharpe ratio. Strategy II demonstrates higher risk-adjusted returns compared with Strategy I under all four macroeconomic conditions, particularly in periods of low volatility, when the Sharpe ratio outperformance is 0.96, and recessions, when the Sharpe ratio outperformance is 1.56.

【题干】Hui Cheung, a portfolio manager, asks her assistant, Ronald Lam, to review the macroeconomic factor model currently in use and to consider a fundamental factor model as an alternative. The current macroeconomic factor model has four factors:

Scenario Analysis Using Sharpe Ratio

Strategy/Regime	High Volatility	Low Volatility
Strategy I	0.88	0.64
Strategy II	1.56	1.60
Difference (II – I)	0.68	0.96

$$R_i = a_i + b_{i1}F_{GDP} + b_{i2}F_{CAP} + b_{i3}F_{CON} + b_{j4}F_{UNEM} + \varepsilon_i,$$

Where F
GDP
>F
CAP
>F
CON
, and F
UNEM
represent unanticipated changes in four factors: gross domestic product, manufacturing capacity utilization, consumer spending, and, the rate of unemployment respectively. Lam assumes the error term is equal to zero when using this model.Lam estimates the current model using historical monthly returns for three port- folios for the most recent fi.ve years. The inputs used in and estimates derived from the macroeconomic factor model are presented in Exhibit 1.The US Treasury bond rate of 2.5% is used as a proxy for the risk-free rate of interest.

Lam uses the macroeconomic model to calculate the tracking error and the mean active return for each portfolio. He presents these statistics in Exhibit 2.

Exhibit 2. Macroeconomic Factor Model Tracking Error and Mean Active Return

Portfolio	Tracking Error	Mean Active Return
Portfolio 1	1.50%	1.50%
Portfolio 2	1.30%	-0.50%
Portfolio 3	1.00%	0.50%

Lam considers a fundamental factor model with four factors:

Exhibit 1. Inputs for and Estimates from the Current Macroeconomic Model					
Factor	Factor Sensitivity and Intercept Coefficients				Factor Surprise (%)
	Portfolio 1	Portfolio 2	Portfolio 3	Benchmark	
Intercept (%)	2.58	3.20	4.33		
F_{GDP}	0.75	1.00	0.24	0.50	0.8
F_{CAP}	-0.23	0.00	-1.45	-1.00	0.5
F_{CON}	1.23	0.00	0.50	1.10	2.5
F_{UNEM}	-0.14	0.00	-0.05	-0.10	1.0
Annual Returns, Most Recent Year					
Return (%)	6.00	4.00	5.00	4.50	

$$R_i = a_j + b_{j1}F_{LIQ} + b_{j2}F_{LEV} + b_{j3}F_{EGR} + b_{j4}F_{VAR} + \varepsilon_j,$$

where F
LIQ
, F
Ley
, F
EGR
, and F
VAR
represent liquidity, financial leverage, earnings growth, and the variability of revenues, respectively.Lam and Cheung discuss similarities and differences between macroeconomic factor models and fundamental factor models, and Lam offers a comparison of those models to statistical factor models. Lam makes the following statements.Statement 1:The factors in fundamental factor models are based on attributes of stocks or companies, whereas the factors in macroeconomic factor models are based on surprises in economic variables.Statement 2:The factor sensitivities are generally determined first in fundamental factor models, whereas the factor sensitivities are estimated last in macroeconomic factor models.Lam also tells Cheung:An advantage of statistical factor models is that they make minimal assumptions, and therefore, statistical factor model estimation lends itself to easier interpretation than macroeconomic and fundamental factor models.Lam tells Cheung that multifactor models can be useful in active portfolio management, but not in passive management. Cheung disagrees; she tells Lam that multifactor models can be useful in both active and passive management.

37.【单项选择题】Based on the information in Exhibit 1, the expected return for Portfolio 1 is closest to:
A.2.58%

B. 3.42%

C. 6.00%

参考答案：A

【莽学解析】When using a macroeconomic factor, the expected return is the intercept (when all model factors take on a value of zero). The intercept coefficient for Portfolio 1in Exhibit 1 is 2.58.

38.【单项选择题】Based on Exhibit 1, the active risk for Portfolio 2 is explained by surprises in:

A. GDP.

B. consumer spending.

C. all four model factors.

参考答案：C

【莽学解析】Active risk, also referred to as tracking risk or tracking error, is the sample standard deviation of the time series of active returns, where the active returns consist of the differences between the portfolio return and the benchmark return. Whereas GDP is the only portfolio non-zero sensitivity for Portfolio 2, the contribution to the portfolio's active return is the sum of the differences between the portfolio's and the benchmark's sensitivities multiplied by the factor return. Because all four of the factor sensitivities of Portfolio 2 are different from the factor sensitivities of the benchmark, all four factors contribute to the portfolio's active return and, therefore, to its active risk.

39.【单项选择题】Based on Exhibit 2, which portfolio has the best information ratio?

A. Portfolio 1

B. Portfolio 2

C. Portfolio 3

参考答案：A

【莽学解析】

A is correct. Portfolio 1 has the highest information ratio, 1.0, and thus has the best mean active return per unit of active risk:

$$\text{IR} = \frac{\overline{R}_P - \overline{R}_B}{s(R_P - R_B)} = \frac{1.50\%}{1.50\%} = 1.00$$

This information ratio exceeds that of Portfolio 2 (-0.38) of Portfolio 3 (0.50).

40.【单项选择题】Which of Lam's statements regarding macroeconomic factor models and fundamental factor models is correct?

A. Only Statement 1

B. Only Statement 2

C. Both Statements 1 and 2

参考答案：C

【莽学解析】In a macroeconomic factor model, the factors are surprises in macroeconomic

variables that significantly explain returns. Factor sensitivities are generally specified first in fundamental factor models, whereas factor sensitivities are estimated last in macroeconomic factor models.

41.【单项选择题】Is Lam's comment regarding statistical factor models correct?
A. Yes
B. No, because he is incorrect with respect to interpretation of the models' results
C. No, because he is incorrect with respect to the models' assumptions
参考答案：B
【莽学解析】An advantage of statistical factor models is that they make minimal assumptions. However, the interpretation of statistical factors is generally more difficult than the interpretation of macroeconomic and fundamental factor models.

42.【单项选择题】Whose statement regarding the use of multifactor models in active and passive portfolio management is correct?
A. Lam only
B. Cheung only
C. Both Lam and Cheung
参考答案：B
【莽学解析】Analysts can use multifactor models in passively managed portfolios to replicate an index fund's factor exposures.

【题干】Emily Yuen is a senior analyst for a consulting firm that specializes in assessing equity strategies using backtesting and simulation techniques. She is working with an assistant, Cameron Ruckey, to develop multifactor portfolio strategies based on nine factors common to the growth style of investing. To do so, Yuen and Ruckey plan to construct nine separate factor portfolios and then use them to create factor-weighted allocation portfolios.
Yuen tasks Ruckey with specifying the investment universe and determining the availability of appropriate reporting data in vendor databases. Ruckey selects a vendor database that does not provide point-in-time data, so he adjusts the database to include point-in-time constituent stocks and a reporting lag of four months.
Next, Yuen and Ruckey run initial backtests on the nine factor portfolios, calculating performance statistics and key metrics for each. For backtesting purposes, the portfolios are rebalanced monthly over a 30-year time horizon using a rolling-window procedure.
Yuen and Ruckey consider a variety of metrics to assess the results of the factor portfolio backtests. Yuen asks Ruckey what can be concluded from the data for three of the factor strategies in Exhibit 1:
Ruckey tells Yuen the following:
Statement 1: We do not need to consider maximum drawdown, because standard deviation sufficiently characterizes risk.
Statement 2: Factor 2 has the highest downside risk.
From her professional experience Yuen knows that benchmark and risk parity factor portfolios, in which factors are equally weighted and equally risk weighted, respectively, are popular with institutional and high-net-worth clients. To gain a more complete picture of these investment strategies' performance, Yuen and Ruckey design a Benchmark Portfolio (A) and a Risk Parity Portfolio (B), and then run two simulation methods to generate investment performance data

Exhibit 1 Backtest Metrics for Factor Strategies

	Factor 1	Fac
VaR (95%)	(3.9%)	(1
Standard deviation of returns	2.1%	1
Maximum drawdown	27.2%	8

based on the underlying factor portfolios, assuming 1,000 simulation trials for each approach:
Approach 1: Historical simulation
Approach 2: Monte Carlo simulation.
Yuen and Ruckey discuss the differences between the two approaches and then design the simulations, making key decisions at various steps. During the process, Yuen expresses a number of concerns:
Concern 1: Returns from six of the nine factors are correlated.
Concern 2: The distribution of Factor 1 returns exhibits excess kurtosis and negative skewness.
Concern 3: The number of simulations needed for Approach 1 is larger than the size of the historical dataset.
For each approach, Yuen and Ruckey run 1,000 trials to obtain 1,000 returns for Portfolios A and B. To help understand the effect of the skewness and excess kurtosis observed in the Factor 1 returns on the performance of Portfolios A and B, Ruckey suggests simulating an additional 1,000 factor returns using a multivariate skewed Student's t-distribution, then repeating the Approach 2 simulation.

43.【单项选择题】Following Ruckey's adjustments to the initial vendor database, backtested returns will most likely be subject to:
A. stale data.
B. data snooping.
C. p-hacking.
参考答案：A
【莽学解析】A reporting lag of four months is likely to introduce stale data into the backtest because many large-capitalization companies report earnings within 30–50 days of quarter end. Although assuming four months (120 days) of reporting lag will eliminate a source of look-ahead bias, it introduces a new problem (i.e., stale data).
B and C are incorrect. Data snooping and p-hacking refer to the same problem: a flawed approach to using data to make decisions. Data snooping and p-hacking are not characteristics of data, nor can they be added to a dataset by making an adjustment.

44.【单项选择题】Based on Exhibit 1, Ruckey should conclude that:
A.Factor Strategy 3 has the highest portfolio turnover.
B.Factor Strategy 2 has less downside risk than Strategy 3.
C.Factor Strategy 2 has the highest returns.
参考答案：B
【莽学解析】Both VaR and maximum drawdown are downside risk measures, and both measures are lower for Strategy 2 than Strategy 3.
A is incorrect. We cannot deduce portfolio turnover from the metrics provided in Exhibit 1.
C is incorrect. We cannot deduce returns from the metrics provided in Exhibit 1.

45.【单项选择题】Which of Ruckey's statements about Exhibit 1 is incorrect?
A.Only Statement 1
B.Only Statement 2
C.Both Statement 1 and Statement 2
参考答案：C
【莽学解析】Both statements are incorrect. Statement 1 is incorrect because maximum drawdown and standard deviation are different measures. Maximum drawdown is typically used to represent downside risk, because it is the minimum cumulative return observed. Standard deviation is a measure of volatility. Although the two measures may be correlated, they are not substitutes for each other. Statement 2 is incorrect because two downside risk measures are presented: VaR and maximum drawdown. Factor Strategy 2 has the lowest reading for both measures, indicating that it has the least downside risk among the three strategies presented in Exhibit 1.

46.【单项选择题】Simulation Approach 1 (historical simulation) differs from Approach 2 (Monte Carlo simulation) in that:
A.it is deterministic.
B.a functional form of the statistical distribution for each decision variable needs to be specified.
C.it assumes that sampling the returns from the actual data provides sufficient guidance about future asset returns.
参考答案：C
【莽学解析】Approach 1 is a historical simulation and assumes that past asset returns provide sufficient guidance about future asset returns.
A is incorrect because both approaches are non-deterministic and random in nature. Approach 1 is a historical simulation, and Approach 2 is a Monte Carlo simulation.
B is incorrect because Approach 1 is a historical simulation and each random variable of interest (key driver and/or decision variable) is randomly drawn from historical data. A functional form of the statistical distribution of returns for each decision variable needs to be specified for a Monte Carlo simulation, which is Approach 2.

47.【单项选择题】To address Concern 1 when designing Approach 2, Yuen should:
A.model each factor or asset on a standalone basis.
B.calculate the 15 covariance matrix elements needed to calibrate the model.
C.specify a multivariate distribution rather than modeling each factor or asset on a standalone basis.

参考答案：C
【莽学解析】Approach 2 is a Monte Carlo simulation. The returns of Portfolios A and B are driven by the returns of the nine underlying factor portfolios (based on nine common growth factors). In the case of asset or factor allocation strategies, the returns from six of the nine factors are correlated, and therefore it is necessary to specify a multivariate distribution rather than modeling each factor or asset on a standalone basis.
A is incorrect because Approach 2 is a Monte Carlo simulation to generate investment performance data for the nine underlying factor portfolios. The returns of six of the nine factors are correlated, which means specifying a multivariate distribution rather than modeling each factor or asset on a standalone basis.
B is incorrect because the analyst should calculate the elements of the covariance matrix for all factors, not only the correlated factors. Doing so entails calculating 36, not 15, elements of the covariance matrix. Approach 2 is a Monte Carlo simulation using the factor allocation strategies for Portfolios A and B for the nine factor portfolios, the returns of which are correlated, which means specifying a multivariate distribution. To calibrate the model, a few key parameters need to be calculated: the mean, the standard deviation, and the covariance matrix. For 9 assets, we need to estimate 9 mean returns, 9 standard deviations, and (9×(9-1))/2=36 elements of the covariance matrix. Assuming just the 6 correlated assets, the calculation is (6×(6-1))/2=15.

48.【单项选择题】Based on Concern 2, the Factor 1 strategy is most likely to:
A.be favored by risk-averse investors.
B.generate surprises in the form of negative returns.
C.have return data that line up tightly around a trend line.
参考答案：B
【莽学解析】The distribution of Factor 1 returns exhibits excess kurtosis and negative skewness (relative to the normal distribution). The excess kurtosis implies that these strategies are more likely to generate surprises, meaning extreme returns, whereas the negative skewness suggests those surprises are more likely to be negative (than positive).
A is incorrect because risk-averse investors are more likely to prefer distribution properties such as positive skew (higher probability of positive returns) and lower to moderate kurtosis (lower probability of extreme negative surprises). The distribution of Factor 1 returns exhibits excess kurtosis and negative skewness.
C is incorrect because the distribution of Factor 1 returns exhibits excess kurtosis and negative skewness. The joint distribution of such returns is rarely multivariate normal—so, typically the means and variances of these returns and the correlations between them are insufficient to describe the joint return distribution. In other words, the return data do not line up tightly around a trend line because of fat tails and outliers.

49.【单项选择题】To address Concern 3 when designing Approach 1, Yuen should:
A.add monthly return observations to the dataset using interpolation.
B.randomly sample from the historical returns with replacement.
C.choose the multivariate normal distribution as the initial functional form.
参考答案：B
【莽学解析】Random sampling with replacement, also known as bootstrapping, is often used in historical simulations because the number of simulations needed is often larger than the size

of the historical dataset. Because Approach 1 is a historical simulation and Concern 3 notes that the number of simulations needed is larger than the size of the historical dataset, bootstrapping should be used.
A is incorrect because this approach would result in creating observations that do not exist in the historical record. Doing so would violate the assumption and procedures of historical simulation.
C is incorrect because choosing the multivariate normal distribution as the initial functional form is typically done in a Monte Carlo simulation (Approach 2), not in a historical simulation (Approach 1). Historical simulation randomly samples from the historical dataset by drawing a number from a uniform distribution so that there is equal probability of being selected. Choice of distribution would not address the concern about the size of the dataset.

50.【单项选择题】The process Ruckey suggests to better understand how the performance of Portfolios A and B using Approach 2 is affected by the distribution of Factor 1 returns is best described as:
A. data snooping.
B. sensitivity analysis.
C. inverse transformation
参考答案：B
【莽学解析】Sensitivity analysis can be implemented to help managers understand how the target variable (portfolio returns) and risk profiles are affected by changes in input variables. Approach 2 is a Monte Carlo simulation, and the results depend on whether the multivariate normal distribution is the correct functional form or a reasonable proxy for the true distribution. Because this information is almost never known, sensitivity analysis using a multivariate skewed Student's t-distribution helps to account for empirical properties such as the skewness and the excess kurtosis observed in the underlying factor return data.
A is incorrect. Data snooping is the subconscious or conscious manipulation of data in a way that produces a statistically significant result (i.e., a p-value that is sufficiently small or a t-statistic that is sufficiently large to indicate statistically significance).
C is incorrect. The inverse transformation method is the process of converting a randomly generated number into a simulated value of a random variable.

【题干】Howie Rutledge is a senior portfolio strategist for an endowment fund. Rutledge meets with recently hired junior analyst Larry Stosur to review the fund's holdings.
Rutledge asks Stosur about the mechanics of exchange-traded funds (ETFs). Stosur responds by making the following statements:
Statement 1: Unlike mutual fund shares that can be shorted, ETF shares cannot be shorted.
Statement 2: In the ETF creation/redemption process, the authorized participants (APs) absorb the costs of transacting securities for the ETF's portfolio.
Statement 3: If ETF shares are trading at a discount to NAV and arbitrage costs are sufficiently low, APs will buy the securities in the creation basket and exchange them for ETF shares from the ETF sponsor.
Rutledge notes that one holding, ETF 1, is trading at a premium to its intraday NAV. He reviews the ETF's pricing and notes that the premium to the intraday NAV is greater than the expected arbitrage costs.
Stosur is evaluating three ETFs for potential investment. He notes that the ETFs have different

portfolio characteristics that are likely to affect each ETF's tracking error. A summary of the characteristics for the ETFs is presented in Exhibit 1.

Exhibit 1 ETF Characteristics Affecting Tracking Error

	ETF 2	ETF 3	ETF 4
Portfolio Construction Approach	Full Replication	Representative Sampling	Full Replication
Type of Foreign Holdings	Local shares	ADRs*	ADRs*
Engagement in Securities Lending	Yes	Yes	No

*ADRs are American Depositary Receipts.

Rutledge and Stosur discuss the factors that influence ETF bid-ask spreads. Stosur tells Rutledge that quoted bid-ask spreads for a particular transaction size are (1) negatively related to the amount of the ongoing order flow in the ETF, (2) positively related to the costs and risks for the ETF liquidity provider, and (3) positively related to the amount of competition among market makers for the ETF.

As ETF shares may trade at prices that are different from the NAV, Rutledge examines selected data in Exhibit 2 for three ETFs that might have this problem.

Exhibit 2 Selected Data on ETFs

	ETF 5	ETF 6	ETF 7
Percentage of Foreign Holdings	10%	50%	90%
Trading Frequency	High	Low	Low

Rutledge considers a new ETF investment for the fund. He plans to own the ETF for nine months. The ETF has the following trading costs and management fees:

Annual management fee of 0.32%

Round-trip trading commissions of 0.20%

Bid-offer spread of 0.10% on purchase and sale

Rutledge asks Stosur to compute the expected total holding period cost for investing in the ETF.

51.【单项选择题】Which of Stosur's statements regarding ETF mechanics is correct?

A. Statement 1

B. Statement 2

C. Statement 3

参考答案：B

【莽学解析】Statement 2 is correct. A significant advantage of the ETF creation/ redemption process is that the AP absorbs all costs of transacting the securities for the fund's

portfolio. APs pass these costs to investors in the ETF's bid-ask spread, incurred by ETF buyers and sellers. Thus, non-transacting shareholders of an ETF are shielded from the negative impact of transaction costs caused by other investors entering and exiting the fund. In contrast, when investors enter or exit a traditional mutual fund, the mutual fund manager incurs costs to buy or sell investments arising from this activity, which affects all fund shareholders. This makes the ETF structure inherently fairer: Frequent ETF traders bear the cost of their activity, while buy-and-hold ETF shareholders are shielded from those costs. Investors cannot short mutual fund shares, but they can short ETF shares. Also, if ETF shares are trading at a discount to NAV and arbitrage costs are sufficiently low, APs will buy ETF shares and exchange them for the securities in the redemption basket. Statement 3 describes the scenario that would occur if the ETF shares are trading at a premium to NAV.
A is incorrect because Statement 1 is incorrect. Investors cannot short mutual fund shares, but they can short ETF shares.
C is incorrect because Statement 3 is incorrect. If ETF shares are trading at a discount to NAV and arbitrage costs are sufficiently low, APs will buy ETF shares and exchange them for the securities in the redemption basket. Statement 3 describes the scenario that would occur if ETF shares are trading at a premium to NAV.

52.【单项选择题】Given the current pricing of ETF 1, the most likely transaction to occur is that:
A. new ETF shares will be created by the APs.
B. redemption baskets will be received by APs from the ETF sponsor.
C. retail investors will exchange baskets of securities that the ETF tracks for creation units.
参考答案：A
【莽学解析】When the share price of an ETF is trading at a premium to its intraday NAV and arbitrage costs are minimal, APs will step in and take advantage of the arbitrage. Specifically, APs will buy the basket of securities that the ETF tracks (the creation basket) and exchange it with the ETF sponsor for new ETF shares (a creation unit). These new ETF shares received by APs can then be sold on the open market to realize arbitrage profits.
B is incorrect because in the case of an ETF trading at a premium to NAV, the APs will not receive redemption baskets of securities. Instead, the APs will deliver creation baskets to the ETF sponsor and receive new ETF shares.
C is incorrect because only APs can deliver creation baskets or receive redemption baskets from the ETF sponsors. Retail investors can buy and sell ETF shares on the open market.

53.【单项选择题】Which ETF in Exhibit 1 is most likely to have the lowest tracking error?
A. ETF 2
B. ETF 3
C. ETF 4
参考答案：A
【莽学解析】Compared with a full replication approach, ETF portfolios managed using a representative sampling/optimization approach are likely to have greater tracking error. Also, differences in trading hours for depositary receipts and local constituent shares create discrepancies between the portfolio and index values. These discrepancies can lead to greater tracking error for portfolios holding ADRs in lieu of the underlying local shares. Further, ETF sponsors that engage in securities lending can generate additional portfolio income to help

offset fund expenses, thereby lowering tracking error. ETF 2 uses a full replication approach, holds only local foreign shares, and engages in securities lending. Therefore, ETF 2 will likely have the lowest tracking error out of the ETFs in Exhibit 1. ETF 3 will likely have greater tracking error than ETF 2 because it is managed using a representative sampling approach and is invested in depositary receipts in lieu of local shares. ETF 4 will likely have greater tracking error than ETF 2 because it is invested in depositary receipts in lieu of local shares and does not engage in securities lending.

54.【单项选择题】Stosur's statement about quoted bid-ask spreads is incorrect with respect to the:

A. amount of the ongoing order flow in the ETF.

B. costs and risks for the ETF liquidity providers.

C. amount of competition among market makers for the ETF.

参考答案：C

【莽学解析】Several factors determine the width of an ETF's quoted bid-ask spread. First, the amount of ongoing order flow in the ETF is negatively related to the bid-ask spread (more flow means lower spreads). Second, the actual costs and risks for the liquidity provider are positively related to spreads (more costs and risks mean higher spreads); the spread is compensation to the liquidity provider for incurring these costs and risks. Finally, the amount of competition among market makers for that ETF is negatively related to the bid-ask spread (more competition means lower spreads).

A is incorrect because Stosur is correct in stating that the quoted bid-ask spread for a particular transaction size is negatively related to the amount of the ongoing order flow in the ETF (more flow means lower spreads).

B is incorrect because Stosur is correct in stating that the quoted bid-ask spread for a particular transaction size is positively related to the costs and risks for the ETF liquidity provider (more costs and risks mean higher spreads). The bid-ask spread represents the market maker's price for taking the other side of the ETF transaction, which includes the costs and risks to carry the position on its books and/or to hedge the position using underlying securities or closely related ETFs or derivatives.

55.【单项选择题】Which ETF in Exhibit 2 is most likely to trade at the largest premium or discount relative to NAV:

A. ETF 5

B. ETF 6

C. ETF 7

参考答案：C

【莽学解析】ETFs that trade infrequently may have large premiums or discounts to NAV, because the ETF may not have traded in the hours leading up to the market close and NAV may have significantly risen or fallen during that time because of market movement. Furthermore, NAV is often a poor fair value indicator for ETFs holding foreign securities because of differences in exchange closing times between the underlying (e.g., foreign stocks, bonds, or commodities) and the exchange where the ETF trades. Therefore, ETF 7 is most likely to have the largest discount or premium because it has a low trading frequency and has the highest percentage of foreign holdings among the three ETFs.

A is incorrect because ETF 5 has the lowest percentage of foreign holdings among the three ETFs

and is the one ETF with a high trading frequency. Therefore, relative to ETF 7, with its low trading frequency and high foreign holdings, ETF 5 is likely to trade at smaller premiums or discounts.
B is incorrect because ETF 6 has a lower percentage of foreign holdings than ETF 7. Even though both ETF 6 and ETF 7 have the same low trading frequency, the lower percentage of foreign holdings for ETF 6 is likely to result in it trading at smaller premiums or discounts.

56.【单项选择题】Excluding the compounding effect, the expected total holding period cost for investing in the ETF over a nine-month holding period is closest to:
A.0.54%.
B.0.62%.
C.0.64%.
参考答案：A
【莽学解析】The expected total holding period cost for investing in the ETF over the nine-month holding period is calculated as follows:
Total expected holding period cost = Annual management fee Round-trip trading commissions Bid－offer spread on purchase/sale.
Total expected holding period cost = (9/12) × (0.32%) 0.20% 0.10% = 0.54%.

【题干】James Frazee is chief investment officer at H&F Capital Investors. Frazee hires a third-party adviser to develop a custom benchmark for three actively managed balanced funds he oversees: Fund X, Fund Y, and Fund Z. (Balanced funds are funds invested in equities and bonds.) The benchmark needs to be composed of 60% global equities and 40% global bonds. The third-party adviser submits the proposed benchmark to Frazee, who rejects the benchmark based on the following concerns:Concern 1: Many securities he wants to purchase are not included in the benchmark portfolio.Concern 2: One position in the benchmark portfolio will be somewhat costly to replicate.Concern 3: The benchmark portfolio is a float-adjusted, capitalization-weighted portfolio.After the third-party adviser makes adjustments to the benchmark to alleviate Frazee's concerns, Frazee accepts the benchmark portfolio. He then asks his research staff to develop risk and expected return forecasts for Funds X, Y, and Z as well as for the benchmark. The forecasts are presented in Exhibit 1.
Frazee decides to add a fourth offering to his group of funds, Fund W, which will use the same benchmark as in Exhibit 1. Frazee estimates Fund W's information ratio to be 0.35. He is considering adding the following constraint to his portfolio construction model: Fund W would now have maximum over- and underweight constraints of 7% on single-country positions.Frazee conducts a search to hire a manager for the global equity portion of Fund W and identifies three candidates. He asks the candidates to prepare risk and return forecasts relative to Fund W's benchmark based on their investment strategy, with the only constraint being no short selling. Each candidate develops independent annual forecasts with active return projections that are uncorrelated and constructs a portfolio made up of stocks that are diverse both geographically and across economic sectors. Selected data for the three candidates' portfolios are presented in Exhibit 2.

Exhibit 1. Forecasted Portfolio Statistics for Funds X, Y, and Z and the Benchmark				
	Fund X	Fund Y	Fund Z	Benchmark
Portfolio weights:				
Global equities (%)	60.0	65.0	68.0	60.0
Global bonds (%)	40.0	35.0	32.0	40.0
Expected return (%)	10.0	11.6	13.2	9.4
Expected volatility (%)	17.1	18.7	22.2	16.3
Active risk (%)	5.2	9.2	15.1	N/A
Sharpe ratio (SR)	0.45	0.50	0.49	0.44
Note: Data are based on a risk-free rate of 2.3%.				

Exhibit 2. Forecasted Portfolio Data for Equity Portion of Fund W			
	Candidate A	Candidate B	Candidate C
Rebalancing	Annually	Annually	Annually
Number of securities	100	64	36
Information ratio (IR)	0.582	0.746	0.723
Transfer coefficient (TC)	0.832	0.777	0.548
Information coefficient*	0.07	0.12	0.22
* Information coefficient based on previously managed funds.			

Frazee asks Candidate C to re-evaluate its portfolio data given the following changes:Change 1: Fix the number of securities to 50.Change 2: Rebalance on a semiannual basis.Change 3: Add maximum over- or underweight constraints on sector weightings.

57.【单项选择题】Which of Frazee's concerns best justifies his decision to reject the proposed benchmark?

A. Concern 1

B. Concern 2

C. Concern 3

参考答案：A

【莽学解析】Because the benchmark does not contain many assets that Frazee wants to invest in, the benchmark may not be representative of his investment approach. Concern 2, as stated, is less important because it does not imply that the cost of replicating the benchmark is a

serious concern. Finally, Concern 3 actually states a generally positive feature of the benchmark.

【题干】Michael Bloomfield is a trader at 2Fast Trading, a proprietary trading company that uses machine learning and algorithms to execute trades. He works with Amy Riley, a junior trader at the company. Bloomfield and Riley meet to review the company's trading systems and several trades in Bloomfield's trading account.

They discuss the increasing impact of market fragmentation on available liquidity for the company's trading strategies. Riley makes the following comments regarding market fragmentation:

Comment 1: Liquidity aggregation and smart order routing help traders manage the challenges and opportunities presented by fragmentation.

Comment 2: With increasing market fragmentation, traders who fill large orders now search for liquidity across multiple venues and across time to control market impact.

Bloomfield tells Riley that he noticed trades of 500 shares of BYYP stock were executed every 20 minutes for an hour. Bloomfield saw the same pattern of trading in the stock during the previous trading day. He instructs Riley to submit an order to purchase BYYP shares on the assumption that a trader seeks liquidity and is executing a large buy order by breaking it into pieces. The prices of these trades and the best bids and offers in the market when the BYYP trades occurred are presented in Exhibit 1.

Exhibit 1 BYYP Trade Details

Trade	Trade Price	Prevailing Bid
1	41.50	41.45
2	41.75	41.73

Bloomfield shifts the conversation to AXZ Corp. Bloomfield notes that AXZ's bid-ask spread is narrow, even though AXZ's share price has been experiencing a period of high volatility. After extensive research, Bloomfield will purchase AXZ shares using a trading strategy that does not include standing orders.

Bloomfield then assesses the risks that 2Fast's electronic trading strategies introduce into the market. He is concerned that these risks may bring on more regulation. Bloomfield claims that the risks can be reduced by changing the structure of the market, and those structural changes can maintain 2Fast's primary competitive advantage, which is trading faster than competitors.

Bloomfield mentions that a regulatory body is investigating a competitor's trading practices. The investigation involves a tip that the competitor is manipulating markets by submitting orders and arranging trades to influence other traders' perceptions of value. Specifically, regulators were informed that the competitor has been buying stock to raise its price, thereby

encouraging momentum traders to buy, and then selling the stock to them at higher prices. The regulator confirmed that the competitor did not use standing limit orders or commonly controlled accounts for the trades under investigation.

58.【单项选择题】Which of Riley's comments related to market fragmentation is accurate?

A. Only Comment 1

B. Only Comment 2

C. Both Comment 1 and Comment 2

参考答案：C

【莽学解析】Both of Riley's comments are correct. Electronic algorithmic trading techniques, such as liquidity aggregation and smart order routing, help traders manage the challenges and opportunities presented by fragmentation. Liquidity aggregators create "super books" that present liquidity across markets for a given instrument. These tools offer global views of market depth (available liquidity) for each instrument regardless of the trading venue that offers the liquidity. Smart order-routing algorithms send orders to the markets that display the best quoted prices and sizes. Additionally, with increasing market fragmentation, traders filling large orders adapt their trading strategies to search for liquidity across multiple venues and across time to control the market impacts of their trades.

59.【单项选择题】Bloomfield's strategy to purchase BYYP shares is best classified as electronic:

A. arbitrage.

B. front running.

C. quote matching.

参考答案：B

【莽学解析】Bloomfield noticed a pattern of trading in BYYP and decided to front run shares on the assumption that a trader is in the market filling a large buy order by breaking it into pieces. Electronic front runners trade in front of traders who demand liquidity. They identify when large traders or many small traders are trying to fill orders on the same side of the market. The order anticipation strategies of electronic front runners try to identify predictable patterns in order submission. They may search for patterns in order submissions, trades, or the relations between trades and other events.

A is incorrect because electronic arbitrageurs look across markets for arbitrage opportunities in which they can buy an undervalued instrument and sell a similar overvalued one. His decision to purchase BYYP shares is based on the pattern of trading that Bloomfield observed.

C is incorrect because quote matchers trade in front of traders who supply (not demand) liquidity. Bloomfield decides to purchase BYYP shares on the assumption that a trader is in the market seeking (not supplying) liquidity, which is consistent with front running (not quote matching). Quote matchers trade in front of traders who supply liquidity and try to exploit the option values of standing orders. Quote matchers buy when they believe they can rely on standing buy orders to get out of their positions, and they sell when they can do the same with standing sell orders.

60.【单项选择题】Based on Exhibit 1, the average effective spread of the BYYP trades is closest to:

A. $0.018.

B. $0.035.

C. $0.070.

参考答案：B

【莽学解析】The effective spread is calculated as follows:

Effective spread = 2 × (Trade price − Midpoint of market at time of order entry)

Effective spread of Trade 1 = 2 × ($41.50 − $41.475) = $0.05

Effective spread of Trade 2 = 2 × ($41.75 − $41.74) = $0.02

Average Effective Spread = ($0.05 + $0.02) / 2 = $0.035

61.【单项选择题】Bloomfield's trading strategy for the purchase of AXZ shares most likely includes the use of:

A. flickering quotes.

B. machine learning.

C. leapfrogging quotes.

参考答案：A

【莽学解析】Flickering quotes are exposed limit orders that electronic traders submit and then cancel shortly thereafter, often within a second. Electronic dealers and algorithmic buy-side traders submit and repeatedly cancel and resubmit their orders when they do not want their orders to stand in the market; rather, they want other traders to see that they are willing to trade at the displayed price. Bloomfield does not want his orders to stand in the market; using flickering quotes to purchase AXZ shares would satisfy that objective.

B is incorrect because AXZ shares are currently in a period of high volatility, so Bloomfield would not likely use machine learning to execute his trades. Machine-learning systems frequently do not produce useful information during volatility episodes because these episodes have few precedents from which the machines can learn. Machine-learning methods produce models based on observed empirical regularities rather than on theoretical principles identified by analysts. Many traders shut down when volatility spikes, both because high-volatility episodes are uncommon and thus not well understood and because even if such episodes were well understood, they represent periods of exceptionally high risk.

C is incorrect because market participants use leapfrogging quotes when spreads are wide (not narrow), and Bloomfield noted that the bid－ask spread for AXZ shares is narrow. When bid－ask spreads are wide, dealers often are willing to trade at better prices than they quote. They quote wide spreads because they hope to trade at more favorable prices. When another trader quotes a better price, dealers often immediately quote an even better price. If the spread is sufficiently wide, a game of leapfrog may ensue as the dealer jumps ahead again.

62.【单项选择题】Which structural change for the market associated with electronic trading systems is most consistent with Bloomfield's claim?

A. Delaying order processing by random intervals.

B. Exchanges using trade halts when prices move too quickly.

C. Slowing markets by running call markets once a second or more often instead of trading continuously.

参考答案：B

【莽学解析】To reduce the systemic risks associated with fast trading, some exchanges have adopted trade halts when prices move too quickly. These rules stop trading when excess demand for liquidity occurs. They also prevent the extreme price changes that can occur in electronic

markets when market orders arrive and no liquidity is present. 2Fast Trading's competitive advantage will be maintained despite exchange trading halts because the company will be free to trade faster than its competitors once trading resumes. Therefore, exchanges using trade halts to stop trading is the risk reduction strategy that most likely maintains 2Fast Trading's competitive advantage and is consistent with Bloomfield's claim that risks can be reduced by changing the structure of the market.

A is incorrect because delaying order processing by random intervals reduces the benefits of high-frequency traders being faster than their competitors and investing in speed. Therefore, delaying order processing by random order intervals does not maintain 2Fast Trading's primary competitive advantage, which is trading faster than competitors, because that advantage will be reduced.

C is incorrect because slowing markets by running call markets once a second or more often instead of trading continuously diminishes the benefits of high-frequency traders being faster than their competitors and investing with speed. Therefore, slowing markets once a second or more often instead of trading continuously does not maintain 2Fast Trading's primary competitive advantage, which is trading faster than competitors, because that advantage will be reduced.

63.【单项选择题】The competitor company's trading is best described as:

A. bluffing.

B. spoofing.

C. wash trading.

参考答案：A

【莽学解析】Bluffing involves submitting orders and arranging trades to influence other traders' perceptions of value. Bluffers often prey on momentum traders, who buy when prices are rising and sell when prices are falling. Similarly, Bloomfield mentioned that regulators were informed that 2Fast's competitor has been submitting orders and arranging trades to influence other traders' perceptions of value; regulators were informed the competitor has been buying stock to raise its price, thereby encouraging momentum traders to buy, and then selling the stock to them at higher prices.

B is incorrect because the competitor did not use standing limit orders—those orders that are used in a spoofing strategy—for the trades the regulator is investigating. Spoofing is a trading practice in which traders place exposed standing limit orders to convey an impression to other traders that the market is more liquid than it is or to suggest to other traders that the security is under- or overvalued.

C is incorrect because the competitor did not use commonly controlled accounts—those accounts that are used in a wash trading strategy—for the trades that regulators are investigating. Wash trading consists of trades arranged among commonly controlled accounts to create the impression of market activity at a particular price. The purpose of wash trading is to fool investors into believing that a market is more liquid than it truly is and to thereby increase investors' confidence both in their ability to exit positions without substantial cost and in their assessments of security values.

【题干】Tina Ming is a senior portfolio manager at Flusk Pension Fund (Flusk). Flusk's portfolio is composed of fixed-income instruments structured to match Flusk's liabilities. Ming works with Shrikant McKee, Flusk's risk analyst. Ming and McKee discuss the latest risk report.

McKee calculated value at risk (VaR) for the entire portfolio using the historical method and assuming a lookback period of five years and 250 trading days per year. McKee presents VaR measures in Exhibit 1.]

Exhibit 1 Flusk Portfolio VaR (in $ millions)

Confidence Interval	Daily VaR	Monthly VaR
95%	1.10	5.37

After reading McKee's report, Ming asks why the number of daily VaR breaches over the last year is zero even though the portfolio has accumulated a substantial loss.Next Ming requests that McKee perform the following two risk analyses on Flusk's portfolio:Analysis 1 Use scenario analysis to evaluate the impact on risk and return of a repeat of the last financial crisis.Analysis 2 Estimate over one year, with a 95% level of confidence, how much Flusk's assets could underperform its liabilities.Ming recommends purchasing newly issued emerging market corporate bonds that have embedded options. Prior to buying the bonds, Ming wants McKee to estimate the effect of the purchase on Flusk's VaR. McKee suggests running a stress test using a historical period specific to emerging markets that encompassed an extreme change in credit spreads.At the conclusion of their conversation, Ming asks the following question about risk management tools: "What are the advantages of VaR compared with other risk measures?"

64.【单项选择题】Based on Exhibit 1, Flusk' portfolio is expected to experience:
A.a minimum daily loss of $1.10 million over the next year.
B.a loss over one month equal to or exceeding $5.37 million 5% of the time.
C.an average daily loss of $1.10 million 5% of the time during the next 250 trading days.
参考答案：B
【莽学解析】VaR is the minimum loss that would be expected a certain percentage of the time over a specified period of time given the assumed market conditions. A 5% VaR is often expressed as its complement--a 95% level of confidence. Therefore, the monthly VaR in Exhibit 1 indicates that $5.37 million is the minimum loss that would be expected to occur over one month 5% of the time. Alternatively, 95% of the time, a loss of more than $5.37 million would not be expected.

65.【单项选择题】The number of Flusk's VaR breaches most likely resulted from:
A.using a standard normal distribution in the VaR model.
B.using a 95% confidence interval instead of a 99% confidence interval.
C.lower market volatility during the last year compared with the lookback period.
参考答案：C
【莽学解析】Flusk experienced zero daily VaR breaches over the last year yet incurred a substantial loss. A limitation of VaR is its vulnerability to different volatility regimes. A portfolio might remain under its VaR limit every day but lose an amount approaching this limit each day. If market volatility during the last year is lower than in the lookback period, the portfolio could accumulate a substantial loss without technically breaching the VaR

constraint.A is incorrect because VaR was calculated using historical simulation, so the distribution used was based on actual historical changes in the key risk factors experienced during the lookback period. Thus, the distribution is not characterized using estimates of the mean return, the standard deviation, or the correlations among the risk factors in the portfolio. In contrast, the parametric method of estimating VaR generally assumes that the distribution of returns for the risk factors is normal.B is incorrect because a specification with a higher confidence level will produce a higher VaR. If a 99% confidence interval was used to calculate historical VaR, the VaR would be larger (larger expected minimum loss). During the last year, none of Flusk's losses were substantial enough to breach the 5% VaR number (95% confidence interval); therefore, if McKee used a 1% VaR (99% confidence interval), the number of VaR breaches would not change.

66.【单项选择题】To perform Analysis 1, McKee should use historical bond:

A.prices.

B.yields.

C.durations.

参考答案：B

【莽学解析】In order to simulate the impact of the latest financial crisis on the current bond portfolio holdings, McKee's valuation model for bonds should use the historical yields of bonds with similar maturity. Historical yields drive the pricing of bonds more than the price history or the current duration. Historical prices for the fixed-income positions currently held in the portfolio may not exist, and even when historical prices do exist, they may not be relevant to the current characteristics (e.g., maturity) of the instrument. Even if the same bonds existed at the time of the latest financial crisis, their durations would change because of the passage of time.A is incorrect because using a bond's past price history would mischaracterize the risk of the current portfolio holdings. For this reason, the historical yields are more important in explaining the risks. Historical prices for the fixed-income positions currently held in the portfolio may not exist, and even when historical prices do exist, they may not be relevant to the current characteristics (e.g., maturity) of the instrument.C is incorrect because historical bond durations would not capture the current characteristics of the bonds in the portfolio. Duration is a sensitivity measure and is the weighted-average time to maturity of a bond. Even if the same bonds existed at the time of the latest financial crisis, their remaining time to maturity and durations would change because of the passage of time.

67.【单项选择题】The limitation of the approach requested for Analysis 1 is that it:

A.omits asset correlations.

B.precludes incorporating portfolio manager actions.

C.assumes no deviation from historical market events.

参考答案：C

【莽学解析】Ming suggested in Analysis 1 to use a historical scenario that measures the hypothetical portfolio return that would result from a repeat of a particular period of financial market history. Historical scenarios are complementary to VaR but are not going to happen in exactly the same way again, and they require additional measures to overcome the

shortcomings of the VaR.

68.【单项选择题】The estimate requested in Analysis 2 is best described as:

A. liquidity gap.

B. surplus at risk.

C. maximum drawdown.

参考答案：B

【莽学解析】Analysis 2 describes surplus at risk. Surplus at risk is an application of VaR; it estimates how much the assets might underperform the liabilities with a given confidence level, usually over a year.

69.【单项选择题】Which measure should McKee use to estimate the effect on Flusk's VaR from Ming's portfolio recommendation?

A. Relative VaR

B. Incremental VaR

C. Conditional VaR

参考答案：B

【莽学解析】Incremental VaR measures the change in a portfolio's VaR as a result of adding or removing a position from the portfolio or if a position size is changed relative to the remaining positions.

70.【单项选择题】When measuring the portfolio impact of the stress test suggested by McKee, which of the following is most likely to produce an accurate result?

A. Marginal VaR

B. Full revaluation of securities

C. The use of sensitivity risk measures

参考答案：B

【莽学解析】McKee suggests running a stress test using a historical scenario specific to emerging markets that includes an extreme change in credit spreads. Stress tests, which apply extreme negative stress to a particular portfolio exposure, are closely related to scenario risk measures. A scenario risk measure estimates the portfolio return that would result from a hypothetical change in markets (hypothetical scenario) or a repeat of a historical event (historical scenario). When the historical simulation fully revalues securities under rate and price changes that occurred during the scenario period, the results should be highly accurate. A is incorrect because marginal VaR measures the change in portfolio VaR given a very small change in a portfolio position (e.g., change in VaR for a $1 or 1% change in the position). Therefore, marginal VaR would not allow McKee to estimate how much the value of the option-embedded bonds would change under an extreme change in credit spreads. C is incorrect because sensitivity risk measures use sensitivity exposure measures, such as first-order (delta, duration) and second-order (gamma, convexity) sensitivity, to assess the change in the value of a financial instrument. Although gamma and convexity can be used with delta and duration to estimate the impact of extreme market movements, they are not suited for scenario analysis related to option-embedded bonds.

71.【单项选择题】The risk management tool referenced in Ming's question:

A. is widely accepted by regulators.
B. takes into account asset liquidity.
C. usually incorporates right-tail events.
参考答案：A
【莽学解析】VaR has emerged as one of the most popular risk measures because global banking regulators require or encourage the use of it. VaR is also frequently found in annual reports of financial firms and can be used for comparisons.

【题干】Brian Johnson is a senior manager at Star Asset Management (SAMN), a large asset management firm in the United States. Tim Martin has just earned his advanced degree in statistics and was hired to support the trading team at SAMN. Martin meets with Johnson to undergo a training relating to SAMN's trading activities. Johnson begins the training with a review of the limit order book for Light Systems, Inc., which is presented in Exhibit 1. Three dealers make market for the shares of Light Systems. Based on these prices, SAMN's trading desk executes a market sell order for 1,100 shares of Light Systems.

Exhibit 1 Limit Order Book for Light Systems, Inc.

Bid				Ask			
Dealer	Time Entered	Price	Size	Dealer	Time Entered	Price	Size
B	10.10 a.m.	$17.15	900	C	10.11 a.m.	$17.19	1,200
C	10.11 a.m.	$17.14	1,500	B	10.10 a.m.	$17.20	800
A	10.11 a.m.	$17.12	1,100	A	10.12 a.m.	$17.22	1,100

Johnson then discusses a market buy order for 5,000 shares of an illiquid stock. The order was filled in three trades, and details about the three trades are presented in Exhibit 2.

Exhibit 2 Buy Trade Order Details

Trade #	Time	Trade Price	Trade Size	Bid Price	Ask Price
1	9.45 a.m.	$25.20	1,200	$25.17	$25.20
2	9.55 a.m.	$25.22	1,300	$25.19	$25.22
3	11.30 a.m.	$25.27	2,500	$25.22	$25.26

Johnson explains to Martin that the number of venues trading the same instruments has proliferated in recent years, and trading in any given instrument has now been distributed across these multiple venues. As a result, the available liquidity on any one of those exchanges represents just a small portion of the aggregate liquidity for that security. As a result, SAMN has had to adapt its trading strategies, particularly for large trades. Johnson

asks Martin about his views on how the introduction of electronic trading might have impacted SAMN. Martin tells Johnson:Statement 1 Once built, electronic trading systems are more efficient and cheaper to operate than floor-based trading systems.Statement 2 Electronic trading systems have attracted a lot of new buy-side traders, and the increased competition has resulted in narrower bid－ask spreads.Statement 3 The introduction of electronic markets has had a much greater impact on the trading of corporate and municipal bonds than on the trading of equities.Johnson tells Martin that communication speed is SAMN's current highest prior-ity. All of SAMN's competitors have increased their communication speeds in recent months, and Johnson says management wants SAMN to be faster than its competi-tors. SAMN's trading desk is located in a residential area far from downtown where the exchanges it works with are located. SAMN's trading team is relatively large with experienced investment professionals, and the firm recently invested in fast computers with the latest algorithms.At the end of the training, Johnson gives Martin his first assignment. The assign-ment is for Martin to use the vast amount of data that SAMN has collected to design a machine learning (ML) model using advanced statistical methods to characterize data structures and relations. Then he has to build a trading algorithm based on the same model. Since electronic trading has added systemic risk to the market, Johnson asks Martin to suggest ways to minimize the systemic risk introduced by his algorithm. Martin offers two suggestions:Suggestion 1 Perform extensive testing of the algorithm before its launch.Suggestion 2 Impose mandatory trading halts if prices change outside a threshold range.A month into the job, Johnson sends Martin to an investment conference focused on abusive trading practices. Based on what he learned at the conference, Martin recommends to Johnson that SAMN incorporate a new rule that news be validated before a trade triggered by news is executed.

72.【单项选择题】Based on Exhibit 1, the inside bid－ask spread for the limit order book for Light Systems is closest to:

A.$0.04.

B.$0.07.

C.$0.10.

参考答案：A

【莽学解析】The inside bid－ask spread, or market bid－ask spread, is the dif-ference between the highest bid price and the lowest ask price. The highest bid price for Light Systems is $17.15, and the lowest ask price is $17.19. Therefore, the inside bid－ask spread = $17.19－$17.15 = $0.04.

73.【单项选择题】Based on Exhibit 1, the total amount that SAMN will receive, on a per share basis, for executing the market sell order is closest to:

A.$17.14.

B.$17.15.

C.$17.22.

参考答案：B

【莽学解析】SAMN's trading desk executes a market sell order for 1,100 shares. Based on the limit order book, the trader would first sell 900 shares at $17.15 (highest bid, Dealer B) and then sell the remaining 200 shares at $17.14 (second highest bid, Dealer C). Therefore, the approximate price per share received by SAMN for selling the 1,100 shares is equal to [(900 × $17.15) + (200 × $17.14)] / 1,100 = $17.1482 per share ($17.15 rounded).

74.【单项选择题】Based on Exhibit 2, the market impact relating to Trade 2, on a per share basis, is closest to:
A. $0.02.
B. $0.03.
C. $0.07.
参考答案：A
【莽学解析】Market impact, or price impact, is the effect of a trade on trans-action prices. After the first trade (Trade 1) was executed at $25.20, Trade 2 was executed at $25.22, which is $0.02 per share higher than the trade price of Trade 1. So, the execution of Trade 1 led to a price impact of $0.02 per share on Trade 2.

75.【单项选择题】Based on Exhibit 2, the average effective spread of the three trades is closest to:
A. $0.0333.
B. $0.0367.
C. $0.0400.
参考答案：C
【莽学解析】The effective bid－ask spread for buy orders is calculated as:

Effective bid–ask spread (buy order) = 2 × {Trade price – [(Ask price
Bid price) / 2)]} or
= 2 × (Trade price – Midpoint o
the market at the time an orde
entered).

So, the effective bid－ask spreads for the three buy trades are calculated as:Effective spread of Trade 1 = 2 × {$25.20 - [($25.20 + $25.17)/2]} = $0.0300.Effective spread of Trade 2 = 2 × {$25.22 - [($25.22 + 25.19)/2]} = $0.0300.Effective spread of Trade 3 = 2 × {$25.27 - [($25.26 + $25.22)/2]} = $0.0600.The resulting average effective spread is then calculated as:Average effective spread = (Effective spread of Trade 1 + Effective spread of Trade 2 + Effective spread of Trade 3)/3.Average effective spread = ($0.0300 + $0.0300 + $0.0600)/3 = $0.0400.

76.【单项选择题】The reason for SAMN having to adapt its trading strategies is a result of:
A. latency.
B. market fragmentation.
C. high frequency trading.
参考答案：B
【莽学解析】According to Johnson, markets have become increasingly frag-mented as the number of venues trading the same instruments has proliferated and trading in any given instrument has been split (or fragmented) across these multiple venues. As a result, the available liquidity on any one exchange represents just a small portion of the aggregate liquidity for that

instrument. This phenomenon is known as market fragmentation and creates the potential for price and liquidity disparities across venues. As a result, SAMN has had to adapt its trading strategies to this fragmented liquidity to avoid intensifying the market impact of a large trade.

77.【单项选择题】Which of Martin's statements relating to the introduction of electronic markets is correct?

A. Statement 1

B. Statement 2

C. Statement 3

参考答案：A

【莽学解析】Once built, electronic systems are indeed cheaper to operate than floor-based trading systems. They require less physical space than do trading floors, and in contrast to floor-based trading systems, they do not require exchange officials to record and report prices. Furthermore, the widespread use of electronic trading systems significantly decreased trading costs for buy-side traders. Costs fell as exchanges obtained greater cost efficiencies from using electronic matching systems instead of floor-based manual trading systems. These technologies also decreased costs and increased efficiencies for the deal-ers and arbitrageurs who provide much of the liquidity offered at exchanges. Competition forced them to pass along much of the benefits of their new tech-nologies to buy-side traders in the form of narrower spreads quoted for larger sizes. New electronic buy-side order management systems also decreased buy-side trading costs by allowing a smaller number of buy-side traders to process more orders and to process them more efficiently than manual traders.While electronic trading has had a significant effect on equity markets, it has not had as much of an effect on the markets for corporate and municipal bonds. The market structures of corporate and municipal bond markets have hardly changed since the late 19th century. Despite the efforts of many creative developers of electronic bond trading systems, most public investors in these markets still trade largely over the counter with dealers.

78.【单项选择题】Which of the following changes should SAMN make to address its key priority?

A. Hire more investment professionals

B. Upgrade to more complex operating systems

C. Move the trading desk physically closer to the exchanges it works with

参考答案：C

【莽学解析】The speed required by electronic traders is affected by fast com-munication and fast computations. The shorter the distance between the trader and the exchange, the faster the communication. Many exchanges allow elec-tronic traders to place their servers in the rooms where the exchange servers operate, a practice called collocation.

79.【单项选择题】The model that Martin is tasked with designing will likely be most effective:

A. for testing new markets.

B. in a well-understood market environment.

C. during periods of higher than normal market volatility.

参考答案：B

【莽学解析】Many trading problems are ideally suited for machine learning analyses because the

problems repeat regularly and often. For such problems, machine-based learning systems can be extraordinarily powerful. However, these systems are often useless—or worse—when trading becomes extraordinary, as when volatilities shoot up. Machine learning systems frequently do not produce useful information during volatility episodes because they have few precedents from which the machines can learn. Thus, traders often instruct their electronic trading systems to stop trading—and sometimes to close out their positions—whenever they recognize that they are entering uncharted territory. Many traders shut down when volatility spikes—both because high-volatility episodes are uncommon and thus not well understood and because even if such episodes were well understood, they represent periods of excep-tionally high risk.

80.【单项选择题】Which of Martin's suggestions will most likely be effective in limiting the sys-temic risk introduced by his algorithm?

A. Only Suggestion 1

B. Only Suggestion 2

C. Both Suggestion 1 and Suggestion 2

参考答案：C

【莽学解析】Both suggestions will likely be effective in minimizing the systemic risk introduced by electronic trading. First, exhaustive testing of the algorithm prior to its launch can minimize risk relating to programming errors, which could result in an extreme market reaction that could trigger an even more extreme market reaction. Second, imposing mandatory trade halts in case of large price changes (outside a given threshold) would limit potential undesired results and help minimize systemic risk.

81.【单项选择题】Which market manipulation strategy is most likely the target of the new rule suggested by Martin?

A. Rumormongering

B. Gunning the market

C. Trading for market impact

参考答案：A

【莽学解析】Rumormongering is the dissemination of false information about fundamental values or about other traders' trading intentions in an attempt to alter investors' value assessments. Martin's suggested news validation rule would reduce the likelihood that SAMN would be adversely affected by this market manipulation strategy.

【题干】Carol Kynnersley is the chief risk officer at Investment Management Advisers (IMA). Kynnersley meets with IMA's portfolio management team and investment advisers to discuss the methods used to measure and manage market risk and how risk metrics are presented in client reports. The three most popular investment funds offered by IMA are the Equity Opportunities, the Diversified Fixed Income, and the Alpha Core Equity. The Equity Opportunities Fund is composed of two exchange-traded funds: a broadly diversi-fied large-cap equity product and one devoted to energy stocks. Kynnersley makes the following statements regarding the risk management policies established for the Equity Opportunities portfolio:Statement 1 IMA's preferred approach to model value at risk (VaR) is to estimate expected returns, volatilities, and correlations under the assumption of a normal distribution. Statement 2 In last year's annual client performance report, IMA stated that a hypothetical $6 million Equity Opportunities Fund account had a daily 5% VaR of approximately 1.5% of portfolio

value.Kynnersley informs the investment advisers that the risk management department recently updated the model for estimating the Equity Opportunities Fund VaR based on the information presented in Exhibit 1.

Exhibit 1 Equity Opportunities Fund—VaR Model Input Assumptions

	Large-Cap ETF	Energy ETF	Total Portfolio
Portfolio weight	65.0%	35.0%	100.0%
Expected annual return	12.0%	18.0%	14.1%
Standard deviation	20.0%	40.0%	26.3%

Correlation between ETFs: 0.90
Number of trading days/year: 250

For clients interested in fixed-income products, IMA offers the Diversified Fixed-Income Fund. Kynnersley explains that the portfolio's bonds are all subject to interest rate risk. To demonstrate how fixed-income exposure measures can be used to identify and manage interest rate risk, Kynnersley distributes two exhibits featuring three hypothetical Treasury coupon bonds (Exhibit 2) under three interest rate scenarios (Exhibit 3).

Exhibit 2 Fixed-Income Risk Measure

Hypothetical Bond	Duration
Bond 1	1.3
Bond 2	3.7
Bond 3	10.2

Exhibit 3: Interest Rate Scenarios

Scenario	Interest Rate Environment
Scenario 1	Rates increase 25 bps
Scenario 2	Rates increase 10 bps
Scenario 3	Rates decrease 20 bps

One of the investment advisers comments that a client recently asked about the performance of

the Diversified Fixed-Income Fund relative to its benchmark, a broad fixed-income index. Kynnersley informs the adviser as follows:Statement 3 The Diversified Fixed-Income Fund manager monitors the historical deviation between portfolio returns and benchmark returns. The fund prospectus stipulates a target deviation from the bench-mark of no more than 5 bps.Kynnersley concludes the meeting by reviewing the constraints IMA imposes on securities included in the Alpha Core Equity Fund. The compliance department conducts daily oversight using numerous risk screens and, when indicated, notifies portfolio managers to make adjustments. Kynnersley makes the following statement:Statement 4 It is important that all clients investing in the fund be made aware of IMA's compliance measures. The Alpha Core Equity Fund restricts the exposure of individual securities to 1.75% of the total portfolio.

82.【单项选择题】Based on Statement 1, IMA's VaR estimation approach is best described as the:
A.parametric method.
B.historical simulation method.
C.Monte Carlo simulation method.
参考答案：A
【莽学解析】VaR is an estimate of the loss that is expected to be exceeded with a given level of probability over a specified time period. The parametric method typically assumes that the return distributions for the risk factors in the port-folio are normal. It then uses the expected return and standard deviation of return for each risk factor and correlations to estimate VaR.

83.【单项选择题】In Statement 2, Kynnersley implies that the portfolio:
A.is at risk of losing $4,500 each trading day.
B.value is expected to decline by $90,000 or more once in 20 trading days.
C.has a 5% chance of falling in value by a maximum of $90,000 on a single trading day.
参考答案：B
【莽学解析】Value at risk is the minimum loss that would be expected a certain percentage of the time over a certain period of time. Statement 2 implies that there is a 5% chance the portfolio will fall in value by $90,000 (= $6,000,000 × 1.5%) or more in a single day. If VaR is measured on a daily basis and a typical month has 20－22 business days, then 5% of the days equates to about 1 day per month or once in 20 trading days.

84.【单项选择题】Based only on Statement 2, the risk measurement approach:
A.ignores right-tail events in the return distribution.
B.is similar to the Sharpe ratio because it is backward looking.
C.provides a relatively accurate risk estimate in both trending and volatile regimes.
参考答案：A
【莽学解析】Statement 2 indicates that the Equity Opportunities Fund reported a daily VaR value. One of the limitations of VaR is that it focuses so heavily on left-tail events (the losses) that right-tail events (potential gains) are often ignored.B is incorrect because VaR is viewed as forward looking in that it uses the current portfolio holdings and measures its potential loss. The Sharpe ratio represents a backward-looking return-based measure and is used to assess the skill of the manager.C is incorrect because VaR does not provide an accurate risk estimate in either trending or volatile regimes. A portfolio might remain under its VaR limit every day but lose an amount approaching this limit each day. Under such circum-stances, the

portfolio could accumulate substantial losses without technically breaching the VaR constraint. Also, during periods of low volatility, VaR will appear quite low, underestimating the losses that could occur when the envi-ronment returns to a normal level of volatility.

85.【单项选择题】Based on Exhibit 1, the daily 5% VaR estimate is closest to:

A.1.61%.

B.2.42%.

C.2.69%.

参考答案：C

【莽学解析】Measuring VaR at a 5% threshold produces an estimated value at risk of 2.69%.From Exhibit 1, the annual portfolio return is 14.1% and the standard deviation is 26.3%. Annual values need to be adjusted to get their daily counterparts. Assuming 250 trading days in a year, the expected annual return is adjusted by dividing by 250 and the standard deviation is adjusted by dividing by the square root of 250.Thus, the daily expected return is 0.141/250 = 0.000564 and volatility is 0263/√250. = 0.016634. 5% daily VaR = E(Rp) - 1.65σp = 0.000564 - 1.65(0.016634) = -0.026882. The portfolio is expected to experience a potential minimum loss in percentage terms of 2.69% on 5% of trading days.

86.【单项选择题】Based only on Exhibits 2 and 3, it is most likely that under:

A.Scenario 1, Bond 2 outperforms Bond 1.

B.Scenario 2, Bond 1 underperforms Bond 3.

C.Scenario 3, Bond 3 is the best performing security.

参考答案：C

【莽学解析】The change in value of a bond is inversely related to a change in yield. Given a bond priced at B with duration D and yield change of Δy, the rate of return or percentage price change for the bond is approximately given as follows: ΔB/B ≈ ?DΔy/(1 + y). Under Scenario 3, interest rates decrease by 20 bps. In an environment of decreasing interest rates, the bond with the highest duration will have the greatest positive return. Bond 3 has a duration of 10.2, which is greater than that of both Bond 1 (duration = 1.3) and Bond 2 (duration = 3.7).

87.【单项选择题】In Statement 4, Kynnersley describes a constraint associated with a:

A.risk budget.

B.position limit.

C.stop-loss limit.

参考答案：B

【莽学解析】Position limits are limits on the market value of any given invest-ment; they are excellent controls on overconcentration. Position limits can be expressed in currency units or as a percentage of net assets. The Alpha Core Equity Fund restricts the exposure of individual securities to 1.75% of the total portfolio.