Fixed Income

PRACTICE PROBLEMS

1. A "buy-and-hold" investor purchases a fixed-rate bond at a discount and holds the security until it matures. Which of the following sources of return is *least likely* to contribute to the investor's total return over the investment horizon, assuming all payments are made as scheduled?

   A. Capital gain

   B. Principal payment

   C. Reinvestment of coupon payments

2. Which of the following sources of return is *most likely* exposed to interest rate risk for an investor of a fixed-rate bond who holds the bond until maturity?

   A. Capital gain or loss

   B. Redemption of principal

   C. Reinvestment of coupon payments

3. An investor purchases a bond at a price above par value. Two years later, the investor sells the bond. The resulting capital gain or loss is measured by comparing the price at which the bond is sold to the:

   A. carrying value.

   B. original purchase price.

   C. original purchase price value plus the amortized amount of the premium.

The following information relates to questions 4-6

An investor purchases a nine-year, 7% annual coupon payment bond at a price equal to par value. After the bond is purchased and before the first coupon is received, interest rates increase to 8%. The investor sells the bond after five years. Assume that interest rates remain unchanged at 8% over the five-year holding period.

4. Per 100 of par value, the future value of the reinvested coupon payments at the end of the holding period is *closest* to:

   A. 35.00.

   B. 40.26.

   C. 41.07.

5. The capital gain/loss per 100 of par value resulting from the sale of the bond at the end of the five-year holding period is *closest* to a:

   A. loss of 8.45.

B. loss of 3.31.

C. gain of 2.75.

6. Assuming that all coupons are reinvested over the holding period, the investor's five-year horizon yield is *closest* to:

A. 5.66%.

B. 6.62%.

C. 7.12%.

7. An investor buys a 6% annual payment bond with three years to maturity. The bond has a yield-to-maturity of 8% and is currently priced at 94.845806 per 100 of par. The bond's Macaulay duration is *closest* to:

A. 2.62.

B. 2.78.

C. 2.83.

8. An investor buys a three-year bond with a 5% coupon rate paid annually. The bond, with a yield-to-maturity of 3%, is purchased at a price of 105.657223 per 100 of par value. Assuming a 5-basis point change in yield-to-maturity, the bond's approximate modified duration is *closest* to:

A. 2.78.

B. 2.86.

C. 5.56.

9. Which of the following statements about duration is correct? A bond's:

A. effective duration is a measure of yield duration.

B. modified duration is a measure of curve duration.

C. modified duration cannot be larger than its Macaulay duration (assuming a positive yield-to-maturity).

10. The interest rate risk of a fixed-rate bond with an embedded call option is *best* measured by:

A. effective duration.

B. modified duration.

C. Macaulay duration.

11. Which of the following is *most* appropriate for measuring a bond's sensitivity to shaping risk?

A. Key rate duration

B. Effective duration

C. Modified duration

12. A Canadian pension fund manager seeks to measure the sensitivity of her pension liabilities to market interest rate changes. The manager determines the present value of the liabilities under three interest rate scenarios: a base rate of 7%, a 100 basis point increase in rates up to 8%, and a 100 basis point drop in rates down to 6%. The results of the manager's analysis are presented below:

Interest Rate Assumption	Present Value of Liabilities
6%	CAD510.1 million
7%	CAD455.4 million
8%	CAD373.6 million

The effective duration of the pension fund's liabilities is *closest* to:

A. 1.49.

B. 14.99.

C. 29.97.

13. Which of the following statements about Macaulay duration is correct?

A. A bond's coupon rate and Macaulay duration are positively related.

B. A bond's Macaulay duration is inversely related to its yield-to-maturity.

C. The Macaulay duration of a zero-coupon bond is less than its time-to-maturity.

14. Assuming no change in the credit risk of a bond, the presence of an embedded put option:

A. reduces the effective duration of the bond.

B. increases the effective duration of the bond.

C. does not change the effective duration of the bond.

15. A bond portfolio consists of the following three fixed-rate bonds. Assume annual coupon payments and no accrued interest on the bonds. Prices are per 100 of par value.

Bond	Maturity	Market Value	Price	Coupon	Yield-to-Maturity	Modified Duration
A	6 years	170,000	85.0000	2.00%	4.95%	5.42
B	10 years	120,000	80.0000	2.40%	4.99%	8.44
C	15 years	100,000	100.0000	5.00%	5.00%	10.38

The bond portfolio's modified duration is *closest* to:

A. 7.62.

B. 8.08.

C. 8.20.

16. A limitation of calculating a bond portfolio's duration as the weighted average of

the yield durations of the individual bonds that compose the portfolio is that it:

A. assumes a parallel shift to the yield curve.

B. is less accurate when the yield curve is less steeply sloped.

C. is not applicable to portfolios that have bonds with embedded options.

17. Using the information below, which bond has the *greatest* money duration per 100 of par value assuming annual coupon payments and no accrued interest?

Bond	Time-to-Maturity	Price Per 100 of Par Value	Coupon Rate	Yield-to-Maturity	Modified Duration
A	6 years	85.00	2.00%	4.95%	5.42
B	10 years	80.00	2.40%	4.99%	8.44
C	9 years	85.78	3.00%	5.00%	7.54

A. Bond A

B. Bond B

C. Bond C

18. A bond with exactly nine years remaining until maturity offers a 3% coupon rate with annual coupons. The bond, with a yield-to-maturity of 5%, is priced at 85.784357 per 100 of par value. The estimated price value of a basis point for the bond is *closest* to:

A. 0.0086.

B. 0.0648.

C. 0.1295.

19. The "second-order" effect on a bond's percentage price change given a change in yield-to-maturity can be *best* described as:

A. duration.

B. convexity.

C. yield volatility.

20. A bond is currently trading for 98.722 per 100 of par value. If the bond's yield-to-maturity (YTM) rises by 10 basis points, the bond's full price is expected to fall to 98.669. If the bond's YTM decreases by 10 basis points, the bond's full price is expected to increase to 98.782. The bond's approximate convexity is *closest* to:

A. 0.071.

B. 70.906.

C. 1,144.628.

21. A bond has an annual modified duration of 7.020 and annual convexity of 65.180. If the bond's yield-to-maturity decreases by 25 basis points, the expected per-

centage price change is *closest* to:

A. 1.73%.

B. 1.76%.

C. 1.78%.

22. A bond has an annual modified duration of 7.140 and annual convexity of 66.200. The bond's yield-to-maturity is expected to increase by 50 basis points. The expected percentage price change is *closest* to:

A. –3.40%.

B. –3.49%.

C. –3.57%.

23. Which of the following statements relating to yield volatility is *most* accurate? If the term structure of yield volatility is downward sloping, then:

A. short-term rates are higher than long-term rates.

B. long-term yields are more stable than short-term yields.

C. short-term bonds will always experience greater price fluctuation than long-term bonds.

24. The holding period for a bond at which the coupon reinvestment risk offsets the market price risk is *best* approximated by:

A. duration gap.

B. modified duration.

C. Macaulay duration.

25. When the investor's investment horizon is less than the Macaulay duration of the bond she owns:

A. the investor is hedged against interest rate risk.

B. reinvestment risk dominates, and the investor is at risk of lower rates.

C. market price risk dominates, and the investor is at risk of higher rates.

26. An investor purchases an annual coupon bond with a 6% coupon rate and exactly 20 years remaining until maturity at a price equal to par value. The investor's investment horizon is eight years. The approximate modified duration of the bond is 11.470 years. The duration gap at the time of purchase is *closest* to:

A. –7.842.

B. 3.470.

C. 4.158.

27. A manufacturing company receives a ratings upgrade and the price increases on its fixed-rate bond. The price increase was *most likely* caused by a(n):

A. decrease in the bond's credit spread.

B. increase in the bond's liquidity spread.

C. increase of the bond's underlying benchmark rate.

28. Empirical duration is likely the best measure of the impact of yield changes on portfolio value, especially under stressed market conditions, for a portfolio consisting of:

A. 100% sovereign bonds of several AAA rated euro area issuers.

B. 100% covered bonds of several AAA rated euro area corporate issuers.

C. 25% AAA rated sovereign bonds, 25% AAA rated corporate bonds, and 50% high-yield (i.e., speculative-grade) corporate bonds, all from various euro area sovereign and corporate issuers.

PRACTICE PROBLEMS

1. The risk that a bond's creditworthiness declines is *best* described by:
   - **A.** credit migration risk.
   - **B.** market liquidity risk.
   - **C.** spread widening risk.

2. Stedsmart Ltd and Fignermo Ltd are alike with respect to financial and operating characteristics, except that Stedsmart Ltd has less publicly traded debt outstanding than Fignermo Ltd. Stedsmart Ltd is *most likely* to have:
   - **A.** no market liquidity risk.
   - **B.** lower market liquidity risk.
   - **C.** higher market liquidity risk.

3. Credit risk of a corporate bond is *best* described as the:
   - **A.** risk that an issuer's creditworthiness deteriorates.
   - **B.** probability that the issuer fails to make full and timely payments.
   - **C.** risk of loss resulting from the issuer failing to make full and timely payments.

4. The risk that the price at which investors can actually transact differs from the quoted price in the market is called:
   - **A.** spread risk.
   - **B.** credit migration risk.
   - **C.** market liquidity risk.

5. Loss severity is *best* described as the:
   - **A.** default probability multiplied by the loss given default.
   - **B.** portion of a bond's value recovered by bondholders in the event of default.
   - **C.** portion of a bond's value, including unpaid interest, an investor loses in the event of default.

6. The two components of credit risk are default probability and:
   - **A.** spread risk.
   - **B.** loss severity.
   - **C.** market liquidity risk.

7. For a high-quality debt issuer with a large amount of publicly traded debt, bond investors tend to devote *most* effort to assessing the issuer's:
   - **A.** default risk.

B. loss severity.

C. market liquidity risk.

8. The expected loss for a given debt instrument is estimated as the product of default probability and:

A. (1 + Recovery rate).

B. (1 – Recovery rate).

C. 1/(1 + Recovery rate).

9. In the event of default, the recovery rate of which of the following bonds would *most likely* be the highest?

A. First mortgage debt

B. Senior unsecured debt

C. Junior subordinate debt

10. During bankruptcy proceedings of a firm, the priority of claims was not strictly adhered to. Which of the following is the *least likely* explanation for this outcome?

A. Senior creditors compromised.

B. The value of secured assets was less than the amount of the claims.

C. A judge's order resulted in actual claims not adhering to strict priority of claims.

11. The priority of claims for senior subordinated debt is:

A. lower than for senior unsecured debt.

B. the same as for senior unsecured debt.

C. higher than for senior unsecured debt.

12. A senior unsecured credit instrument holds a higher priority of claims than one ranked as:

A. mortgage debt.

B. second lien loan.

C. senior subordinated.

13. In a bankruptcy proceeding, when the absolute priority of claims is enforced:

A. senior subordinated creditors rank above second lien holders.

B. preferred equity shareholders rank above unsecured creditors.

C. creditors with a secured claim have the first right to the value of that specific property.

14. In the event of default, which of the following is *most likely* to have the highest

recovery rate?

A. Second lien

B. Senior unsecured

C. Senior subordinated

15. Which of the following corporate debt instruments has the highest seniority ranking?

A. Second lien

B. Senior unsecured

C. Senior subordinated

16. A fixed-income analyst is *least likely* to conduct an independent analysis of credit risk because credit rating agencies:

A. may at times mis-rate issues.

B. often lag the market in pricing credit risk.

C. cannot foresee future debt-financed acquisitions.

17. The process of moving credit ratings of different issues up or down from the issuer rating in response to different payment priorities is *best* described as:

A. notching.

B. structural subordination.

C. cross-default provisions.

18. The factor considered by rating agencies when a corporation has debt at both its parent holding company and operating subsidiaries is *best* referred to as:

A. credit migration risk.

B. corporate family rating.

C. structural subordination.

19. Which type of security is *most likely* to have the same rating as the issuer?

A. Preferred stock

B. Senior secured bond

C. Senior unsecured bond

20. An issuer credit rating usually applies to a company's:

A. secured debt.

B. subordinated debt.

C. senior unsecured debt.

21. The rating agency process whereby the credit ratings on issues are moved up or

down from the issuer rating *best* describes:

A. notching.

B. pari passu ranking.

C. cross-default provisions.

22. The notching adjustment for corporate bonds rated Aa2/AA is *most likely*:

A. larger than the notching adjustment for corporate bonds rated B2/B.

B. the same as the notching adjustment for corporate bonds rated B2/B.

C. smaller than the notching adjustment for corporate bonds rated B2/B.

23. Which of the following statements about credit ratings is *most accurate*?

A. Credit ratings can migrate over time.

B. Changes in bond credit ratings precede changes in bond prices.

C. Credit ratings are focused on expected loss rather than risk of default.

24. If goodwill makes up a large percentage of a company's total assets, this *most likely* indicates that:

A. the company has low free cash flow before dividends.

B. there is a low likelihood that the market price of the company's common stock is below book value.

C. a large percentage of the company's assets are not of high quality.

25. In order to analyze the **collateral** of a company, a credit analyst should assess the:

A. cash flows of the company.

B. soundness of management's strategy.

C. value of the company's assets in relation to the level of debt.

26. In order to determine the **capacity** of a company, it would be *most* appropriate to analyze the:

A. company's strategy.

B. growth prospects of the industry.

C. aggressiveness of the company's accounting policies.

27. A credit analyst is evaluating the credit worthiness of three companies: a construction company, a travel and tourism company, and a beverage company. Both the construction and travel and tourism companies are cyclical, whereas the beverage company is non-cyclical. The construction company has the highest debt level of the three companies. The highest credit risk is *most likely* exhibited by the:

A. construction company.

B. beverage company.

C. travel and tourism company.

28. Based on the information provided in Exhibit 1, the EBITDA interest coverage ratio of Adidas AG is *closest* to:

A. 16.02x.

B. 23.34x.

C. 37.98x.

Exhibit 1: Adidas AG Excerpt from Consolidated Income Statement in a given year (€ in millions)

Gross profit	12,293
Royalty and commission income	154
Other operating income	56
Other operating expenses	9,843
Operating profit	2,660
Interest income	64
Interest expense	166
Income before taxes	2,558
Income taxes	640
Net income	1,918

Additional information:
Depreciation and amortization: €1,214 million

Source: Adidas AG Annual Financial Statements, December 2019.

29. The following information is from the annual report of Adidas AG for December 2019:

- Depreciation and amortization: €1,214 million
- Total assets: €20,640 million
- Total debt: €4,364 million
- Shareholders' equity: €7,058 million

The debt/capital of Adidas AG is *closest* to:

A. 21.14%.

B. 38.21%.

C. 61.83%.

30. Funds from operations (FFO) of Pay Handle Ltd (a fictitious company) increased in 20X1. In 20X1, the total debt of the company remained unchanged while additional common shares were issued. Pay Handle Ltd's ability to service its debt in 20X1, as compared to 20X0, *most likely*:

A. improved.

B. worsened.

C. remained the same.

31. Based on the information in Exhibit 2, GZ Group's (a hypothetical company) credit risk is *most likely*:

A. lower than the industry.

B. higher than the industry.

C. the same as the industry.

Exhibit 2: European Food, Beverage, and Tobacco Industry and GZ Group Selected Financial Ratios for 20X0

	Total Debt/Total Capital (%)	FFO/Total Debt (%)	Return on Capital (%)	Total Debt/ EBITDA (x)	EBITDA Interest Coverage (x)
GZ Group	47.1	77.5	19.6	1.2	17.7
Industry median	**42.4**	**23.6**	**6.55**	**2.85**	**6.45**

32. Based on the information in Exhibit 3, the credit rating of DCM Group (a hypothetical company in the European food & beverage sector) is *most likely*:

A. lower than AB plc.

B. higher than AB plc.

C. the same as AB plc.

Exhibit 3: DCM Group and AB plc Selected Financial Ratios for 20X0

Company	Total Debt/Total Capital (%)	FFO/Total Debt (%)	Return on Capital (%)	Total Debt/EBITDA (x)	EBITDA Interest Coverage (x)
AB plc	0.2	84.3	0.1	1.0	13.9
DCM Group	42.9	22.9	8.2	3.2	3.2
European Food, Beverage, and Tobacco median	**42.4**	**23.6**	**6.55**	**2.85**	**6.45**

33. Which industry characteristic *most likely* has a positive effect on a company's ability to service debt?

A. Low barriers to entry in the industry

B. High number of suppliers to the industry

C. Broadly dispersed market share among large number of companies in the industry

34. When determining the capacity of a borrower to service debt, a credit analyst should begin with an examination of:

A. industry structure.

B. industry fundamentals.

C. company fundamentals.

35. Which of the following accounting issues should *mostly likely* be considered a character warning flag in credit analysis?

A. Expensing items immediately

B. Changing auditors infrequently

C. Significant off-balance-sheet financing

36. In credit analysis, capacity is *best* described as the:

A. quality of management.

B. ability of the borrower to make its debt payments on time.

C. quality and value of the assets supporting an issuer's indebtedness.

37. Among the four Cs of credit analysis, the recognition of revenue prematurely *most likely* reflects a company's:

A. character.

B. covenants.

C. collateral.

The following information relates to questions 38-39

Exhibit 1: Industrial Comparative Ratio Analysis, Year 20XX

	EBITDA Margin (%)	Return on Capital (%)	EBIT/ Interest Expense (×)	EBITDA/ Interest Expense (×)	Debt/ EBITDA (×)	Debt/ Capital (%)
Company A	25.1	25.0	15.9	19.6	1.6	35.2
Company B	29.6	36.3	58.2	62.4	0.5	15.9
Company C	21.8	16.6	8.9	12.4	2.5	46.3

38. Based on only the leverage ratios in Exhibit 1, the company with the *highest* credit risk is:

A. Company A.

B. Company B.

C. Company C.

39. Based on only the coverage ratios in Exhibit 4, the company with the *highest* credit quality is:

A. Company A.

B. Company B.

C. Company C.

The following information relates to questions 40-41

Exhibit 1: Consolidated Income Statement (£ millions)

	Company X	Company Y
Net revenues	50.7	83.7
Operating expenses	49.6	70.4
Operating income	1.1	13.3
Interest income	0.0	0.0
Interest expense	0.6	0.8
Income before income taxes	0.5	12.5
Provision for income taxes	–0.2	–3.5
Net income	0.3	9.0

Exhibit 2: Consolidated Balance Sheets (£ millions)

	Company X	Company Y
ASSETS		
Current assets	10.3	21.9
Property, plant, and equipment, net	3.5	20.1
Goodwill	8.3	85.0
Other assets	0.9	5.1
Total assets	23.0	132.1
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities		

	Company X	Company Y
Accounts payable and accrued expenses	8.4	16.2
Short-term debt	0.5	8.7
Total current liabilities	8.9	24.9
Long-term debt	11.7	21.1
Other non-current liabilities	1.1	22.1
Total liabilities	21.7	68.1
Total shareholders' equity	1.3	64.0
Total liabilities and shareholders' equity	23.0	132.1

Exhibit 3: Consolidated Statements of Cash Flow (£ millions)

	Company X	Company Y
CASH FLOWS FROM OPERATING ACTIVITIES		
Net income	0.3	9.0
Depreciation	1.0	3.8
Goodwill impairment	2.0	1.6
Changes in working capital	0.0	–0.4
Net cash provided by operating activities	3.3	14.0
CASH FLOWS FROM INVESTING ACTIVITIES		
Additions to property and equipment	–1.0	–4.0
Additions to marketable securities	–0.1	0.0
Proceeds from sale of property and equipment	0.2	2.9
Proceeds from sale of marketable securities	0.3	0.0
Net cash used in investing activities	–0.6	–1.1
CASH FLOWS FROM FINANCING ACTIVITIES		
Repurchase of common stock	–1.5	–4.0
Dividends to shareholders	–0.3	–6.1
Change in short-term debt	0.0	–3.4
Additions to long-term debt	3.9	3.9
Reductions in long-term debt	–3.4	–2.5
Net cash–financing activities	–1.3	–12.1
NET INCREASE IN CASH AND CASH EQUIVALENTS	1.4	0.8

40. Based on Exhibits 1–3, in comparison to Company X, Company Y has a higher:

A. debt/capital.

B. debt/EBITDA.

C. free cash flow after dividends/debt.

41. Based on Exhibits 5–7, in comparison to Company Y, Company X has greater:

A. leverage.

B. interest coverage.

C. operating profit margin.

42. Holding all other factors constant, the *most likely* effect of low demand and heavy new issue supply on bond yield spreads is that yield spreads will:

A. widen.

B. tighten.

C. not be affected.

43. Credit yield spreads *most likely* widen in response to:

A. high demand for bonds.

B. weak performance of equities.

C. strengthening economic conditions.

44. The factor that *most likely* results in corporate credit spreads widening is:

A. an improving credit cycle.

B. weakening economic conditions.

C. a period of high demand for bonds.

45. Credit spreads are *most likely* to widen:

A. in a strengthening economy.

B. as the credit cycle improves.

C. in periods of heavy new issue supply and low borrower demand.

46. Which of the following factors in credit analysis is more important for general obligation non-sovereign government debt than for sovereign debt?

A. Per capita income

B. Power to levy and collect taxes

C. Requirement to balance an operating budget

47. In contrast to high-yield credit analysis, investment-grade analysis is *more likely* to rely on:

A. spread risk.

B. anassessment of bank credit facilities.

C. matching of liquidity sources to upcoming debt maturities.

48. Which of the following factors would *best* justify a decision to avoid investing in a country's sovereign debt?

A. Freely floating currency

B. A population that is not growing

C. Suitable checks and balances in policymaking

Derivatives

PRACTICE PROBLEMS

Montau AG is a German capital goods producer that manufactures its products domestically and delivers its products to clients globally. Montau's global sales manager shares the following draft commercial contract with his Treasury team:

Montau AG Commercial Export Contract

Contract Date:	[Today]
Goods Seller:	Montau AG, Frankfurt, Germany
Goods Buyer:	Jeon Inc., Seoul, Korea
Description of Goods:	A-Series Laser Cutting Machine
Quantity:	One
Delivery Terms:	Freight on Board (FOB), Busan Korea with all shipping, tax and delivery costs payable by Goods Buyer
Delivery Date:	[75 Days from Contract Date]
Payment Terms:	100% of Contract Price payable by Goods Buyer to Good Seller on Delivery Date
Contract Price:	KRW650,000,000

Montau AG's Treasury manager is tasked with addressing the financial risk of this prospective transaction.

1. Which of the following statements best describes why Montau AG should consider a derivative rather than a spot market transaction to manage the financial risk of this commercial contract?

   A. Montau AG is selling a machine at a contract price in KRW and incurs costs based in EUR.

   B. Montau AG faces a 75-day timing difference between the commercial contract date and the delivery date when Montau AG is paid for the machine in KRW.

   C. Montau AG is unable to sell KRW today in order to offset the contract price of machinery delivered to Jeon Inc.

2. Which of the following types of derivative and underlyings are best suited to hedge Montau's financial risk under the commercial transaction?

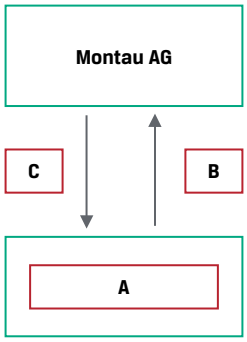
   A. Montau AG should consider a firm commitment derivative with currency as an underlying, specifically the sale of KRW at a fixed EUR price.

   B. Montau AG should consider a contingent claim derivative with the price of the machine as its underlying, specifically an A-series laser cutting machine.

   C. Montau AG should consider a contingent claim derivative with currency as an underlying, specifically the sale of EUR at a fixed KRW price.

3. Identify A, B, and C in the correct order in the following diagram, as in Exhibit 1, for the derivative to hedge Montau's financial risk under the commercial transaction.

Exhibit 1



A. A: Financial intermediary, B: KRW650,000,000, C: Fixed EUR amount

B. A: Jeon Inc., B: KRW650,000,000, C: Fixed EUR amount

C. A: Financial intermediary, B: Fixed EUR amount, C: KRW650,000,000.

4. Which of the following statements about the most appropriate derivative market to hedge Montau AG's financial risk under the commercial contract is most accurate?

A. The OTC market is most appropriate for Montau, as it is able to customize the contract to match its desired risk exposure profile.

B. The ETD market is most appropriate for Montau, as it offers a standardized and transparent contract to match its desired risk exposure profile.

C. Both the ETD and OTC markets are appropriate for Montau AG to hedge its financial risk under the transaction, so it should choose the market with the best price.

PRACTICE PROBLEMS

Biomian Limited is a Mumbai-based biotech company with common stock and listed futures and options on the National Stock Exchange (NSE). The Viswan Family Office (VFO) currently owns 10,000 Biomian common shares. VFO would like to reduce its long Biomian position and diversify its equity market exposure but will delay a cash sale of shares for tax reasons for six months.

1. Which of the following derivative contracts available to VFO's chief investment officer is best suited to reduce exposure to a decline in Biomian's stock price in the next six months?
   - **A.** A short put position on Biomian stock that expires in six months
   - **B.** A long call position on Biomian stock that expires in six months
   - **C.** A short futures position in Biomian stock that settles in six months

2. VFO's market strategist believes that Biomian's share price will rise over the next six months but would like to protect against a decline in Biomian's share price over the period. Which of the following positions is best suited for VFO to manage its existing Biomian exposure based on this view?
   - **A.** A long put position on Biomian stock that expires in six months
   - **B.** A short call position on Biomian stock that expires in six months
   - **C.** A long futures position in Biomian stock that settles in six months

3. Assume that Biomian shares rise over the next six months. Which of the following statements about VFO's derivative strategies under this scenario is most accurate?
   - **A.** A forward sale of Biomian shares in six months would be more profitable than purchasing the right to sell Biomian shares in six months.
   - **B.** Purchasing the right to sell Biomian shares in six months would be more profitable than a forward sale of Biomian shares in six months.
   - **C.** We do not have enough information to determine whether a forward sale or the right to sell Biomian shares will be more profitable in six months.

4. VFO's market strategist is considering a six-month call option strategy on the NIFTY 50 benchmark Indian stock market index to increase broad market equity exposure. The NIFTY 50 price today is INR15,200, and the strategist observes that a call option with a INR16,000 exercise price (X) is trading at a premium of INR1,500. Which of the following represents the payoff and profit of this strategy just prior to maturity if the NIFTY 50 is trading at INR16,500?
   - **A.** Payoff is INR500; profit is –INR1,000.

B. Payoff is INR1,300; profit is INR800.

C. Payoff is INR1,300; profit is INR500.

PRACTICE PROBLEMS

Consider the following structured note offered by Baywhite Financial:

Baywhite Financial LLC 80% Principal Protected Structured Note

Description:	The Baywhite Financial LLC 80% Principal Protected Structured Note ("the Note") is linked to the performance of the S&P 500 Health Care Select Sector Index (SIXV).
Issuer:	Baywhite Financial LLC
Start Date:	[Today]
Maturity Date:	[Six months from Start Date]
Issuance Price:	102% of Face Value
Face Value:	Sold in a minimum denomination of USD1,000 and multiple units thereof
Payment at Maturity:	At maturity, you will receive a cash payment, for each USD1,000 principal amount note, of USD800 plus the Additional Amount, which may be zero.
Partial Principal Protection Percentage:	80% Principal Protection (20% Principal at Risk)
Additional Amount:	At maturity, you will receive the greater of 100% of the returns on the S&P 500 Health Care Select Sector Index (SIXV) in excess of 5% above the current spot price of the SIXV or zero.

As a financial analyst for a wealth management advisory firm, you have been tasked with comparing the features of the Baywhite Financial LLC Structured Note with those of a similar exchange-traded, stand-alone derivative instrument alternative in order to make a recommendation to the firm's clients.

1. Which of the following statements best describes the derivative instrument that is embedded in the Baywhite Financial LLC Structured Note?

   A. The Structured Note has an embedded long futures contract with the S&P 500 Health Care Select Sector Index (SIXV) as an underlying.

   B. The Structured Note has an embedded long call option contract with the S&P 500 Health Care Select Sector Index (SIXV) as an underlying.

   C. The Structured Note has an embedded short put option contract with the S&P 500 Health Care Select Sector Index (SIXV) as an underlying.

2. Which of the following statements best contrasts the credit risk of the Baywhite Financial LLC Structured Note with the counterparty credit risk of an investor entering into the embedded exchange-traded derivative on a stand-alone basis?

   A. An investor in the Baywhite Structured Note assumes the credit risk of Baywhite Financial LLC for 20% of the note's face value, as the remaining 80% is principal protected. An investor entering into the SIXV derivative on a stand-alone basis assumes the counterparty credit risk of a financial intermediary.

B. An investor in the Baywhite Structured Note assumes the credit risk of Baywhite Financial LLC for 80% of the note's face value, as the remaining 20% is associated with the embedded derivative. An investor entering into the SIXV derivative on a stand-alone basis assumes the counterparty credit risk of a financial intermediary.

C. An investor in the Baywhite Structured Note assumes the credit risk of Baywhite Financial LLC for 100% of the note's face value, while an investor entering into the SIXV derivative on a stand-alone basis assumes the counterparty credit risk of an exchange and its clearinghouse.

3. Which of the following statements most accurately describes the liquidity of the Baywhite Structured Note versus that of the embedded exchange-traded derivative?

A. The Baywhite Structured Note is likely to be more liquid than the stand-alone SIXV call option, as the Note has 80% principal protection while an investor in the stand-alone derivative may lose the entire option premium if it expires worthless at maturity.

B. The Baywhite Structured Note is likely to be more liquid than the stand-alone SIXV call option, as the Note is priced at a stated 2% premium above par while an investor in the stand-alone derivative faces the lack of transparency as well as basis, liquidity, and counterparty credit risks associated with derivative transactions.

C. Structured notes such as the Baywhite Financial LLC Structured Note often involve greater cost, lower liquidity, and less transparency than an equivalent stand-alone derivative instrument, while the exchange-traded SIXV derivative contract is standardized and trades in a liquid, transparent market.

4. Which of the following statements best describes how an investor should evaluate the terms of the Baywhite Financial LLC Structured Note as compared with the stand-alone derivative price in order to make a recommendation?

A. The Baywhite Financial LLC Structured Note issuance price of 2% above par value should be compared with the upfront premium for a six-month SIXV call option with an exercise price at 5% above the current SIXV spot price.

B. The Baywhite Financial LLC Structured Note 20% Principal at Risk should be compared with the upfront premium for a six-month SIXV call option with an exercise price at 5% above the current SIXV spot price.

C. The Baywhite Financial LLC Structured Note issuance price of 2% above par value *plus* the 20% Principal at Risk should be compared with the upfront premium for a six-month SIXV call option with an exercise price at 5% above the current SIXV spot price.

PRACTICE PROBLEMS

Baywhite Financial is a broker-dealer and wealth management firm that helps its clients manage their portfolios using stand-alone derivative strategies. A new Baywhite analyst is asked to evaluate the following client situations.

1. Match the following definitions with their corresponding forward pricing or valuation component.

1. Equal to the difference between the current spot price (adjusted by remaining costs and benefits through maturity) and the present value of the forward price	A. Forward contract MTM value at inception, $V_0(T)$
2. Future value of the underlying asset spot price (S_0) compounded at the risk-free rate incorporating the present value of the costs and benefits of asset ownership	B. Forward contract MTM value between inception and maturity, $V_t(T)$
3. Under no-arbitrage conditions for a given underlying spot price, S_0, adjusted by the costs and benefits, risk-free rate (r), and forward price, $F_0(T)$, this should be equal to zero (ignoring transaction costs).	C. Forward price, $F_0(T)$

2. A Baywhite client currently owns 5,000 common non-dividend-paying shares of Vivivyu Inc. (VIVU), a digital media company, at a spot price of USD173 per share. The client enters into a forward commitment to sell half of its VIVU position in six months at a price of USD175.58. Which of the following market events is most likely to result in the greatest gain in the VIVU forward contract MTM value from the client's perspective?

A. An increase in the risk-free rate

B. An immediate decline in the VIVU spot price following contract inception

C. A steady rise in the spot price of VIVU stock over time

3. A Baywhite client has entered into a long six-month MXN/USD FX forward contract—that is, an agreement to sell MXN and buy USD. The MXN/USD spot exchange rate at inception is 19.8248 (MXN19.8248 = USD1), the six-month MXN risk-free rate is 4.25%, and the six-month USD risk-free rate is 0.5%. Baywhite's market strategist predicts that the Mexican central bank (Banco de Mexico) will surprise the market with a 50 bp short-term rate cut at its upcoming meeting. Which of the following statements best describes how the client's existing FX forward contract will be impacted if this prediction is realized and other parameters remain unchanged?

A. The lower interest rate differential between MXN and USD will cause the MXN/USD contract forward rate to be adjusted downward.

B. The client will realize an MTM gain on the FX forward contract due to the decline in the MXN versus USD interest rate differential.

C. The lower interest rate differential between MXN and USD will cause the client to realize an MTM loss on the MXN/USD forward contract.

4. A client seeking advice on her fixed-income portfolio observes the price and yield-to-maturity of one-year (r_1) and two-year (r_2) annual coupon government benchmark bonds currently available in the market. Which of the following statements best describes how the analyst can determine a breakeven reinvestment rate in one year's time to help decide whether to invest now for one or two years?

A. As the two-year rate involves intermediate cash flows, divide the square root of $(1 + r_2)$ by $(1 + r_1)$ and subtract 1 to arrive at a breakeven reinvestment rate for one year in one year's time.

B. Since the first year's returns are compounded in the second year, set $(1 + r_1)$ multiplied by 1 plus the breakeven reinvestment rate equal to $(1 + r_2)^2$ and solve for the breakeven reinvestment rate.

C. Since the breakeven reinvestment involves a zero-coupon cash flow, first substitute the one-year rate (r_1) into the two-year bond price equation to solve for the two-year spot or zero rate (z_2), then set $(1 + r_1) \times (1 +$ breakeven reinvestment rate$) = (1 + z_2)^2$ and solve for the breakeven reinvestment rate.

5. Baywhite Financial seeks to gain a competitive advantage by making margin loans at fixed rates for up to 60 days to its investor clients. Since Baywhite borrows at a variable one-month market reference rate to finance these client loans, the firm enters into one-month FRA contracts on one-month MRR to hedge the interest rate exposure of its margin loan book. Which of the following statements best describes Baywhite's interest rate exposure and the FRA position it should take to hedge that exposure?

A. Baywhite faces exposure to a *rise* in one-month MRR over the next 30 days, so it should enter into the FRA as a fixed-rate *payer* in order to benefit from a rise in one-month MRR above the FRA rate and offset its higher borrowing cost.

B. Baywhite faces exposure to a *rise* in one-month MRR over the next 30 days, so it should enter into the FRA as a fixed-rate *receiver* in order to benefit from a rise in one-month MRR above the FRA rate and offset its higher borrowing cost.

C. Baywhite faces exposure to a *decline* in one-month MRR over the next 30 days, so it should enter into the FRA as a fixed-rate *receiver* in order to benefit from a rise in one-month MRR above the FRA rate and offset its higher borrowing cost.

PRACTICE PROBLEMS

Ace Limited is a financial intermediary active in both futures and forward markets. You have been hired as an investment consultant and asked to review Ace's activities and answer the following questions.

1. Ace serves as a futures commission merchant to assist several of its commodity trading adviser (CTA) clients to clear and settle their futures margin positions with the futures exchange. Ace is reviewing the copper futures market for a CTA client considering a long copper futures position for the first time. Details of the copper futures market are as follows:

CME Copper Futures Contract Specifications

Contract Maturities:	Monthly [from 1 month to 15 months]
Contract Size:	25,000 pounds
Delivery Type:	Cash settled
Price Quotation:	$ per pound
Initial Margin:	$10,000 per contract
Maintenance Margin:	$6,000 per contract
Final Maturity:	Last CME business day of contract month
Daily Settlement:	CME Trading Operations calculates daily settlement values based on its published procedures

Today's copper spot price is $4.25 per pound, and the constant risk-free rate is 1.875%. Each contract has a $10 storage cost payable at the end of the month. Which of the following statements best characterizes the margin exposure profile of Ace's CTA client if it enters a one-month copper futures contract?

A. The CTA will be expected to post $10,000 initial margin and would receive a margin call if the copper futures price were to immediately fall below $4.10 per pound or below a price of $102,425 per contract.

B. The CTA would be expected to post $10,000 in initial margin and would receive a margin call at any time over the life of the contract if the copper futures price were to immediately fall below $3.86 per pound or below a price of $96,425 per contract.

C. The CTA will be expected to post $10,000 initial margin, but we cannot determine the exact futures price at which a margin call will occur as the futures MTM is settled each day and the contract value resets to zero.

2. One of Ace's investor clients has entered a long six-month forward transaction with Ace on 100 shares of Xenaliya (XLYA), a non-dividend-paying technology stock. The stock's spot price per share, S_0, is €85, and the risk-free rate is a constant 1% for all maturities. Ace has hedged the client transaction with a long six-month XLYA futures contract at a price $f_0(T)$ of €85.42 and posted initial margin of €1,000. Three months after the forward and futures contracts are initiated, XYLA announces a strategic partnership with a major global technology

firm, and its spot share price jumps €15 on the day's trading to close at €123. Which of the following statements best characterizes the impact of the day's trading on the MTM value of the forward versus the futures contract?

A. Ace's client realizes an MTM gain of approximately €1,500 (= €15 × 100) on its margin account, which Ace must deposit at the end of the day to cover its margin call.

B. Ace's client benefits from an MTM unrealized gain on its forward contract with Ace, and Ace has a corresponding MTM gain of approximately €1,500 (= €15 × 100) deposited in its margin account by the exchange.

C. Because Ace has entered a hedge of its client's long forward position on XLYA by executing a futures contract with otherwise identical terms, the two contract MTM values exactly offset one another and no cash is exchanged on either transaction.

3. Identify which of the following corresponds to which description.

1. Long interest rate futures position	A. Results in a gain when MRR settles above the initial forward commitment rate at maturity
2. Pay fixed (receive floating) FRA contract	B. Results in a loss when MRR settles above the initial forward commitment rate at maturity
3. Receive fixed (pay floating) FRA contract	C. Has a forward commitment price that will increase as short-term interest rates fall

4. Ace's investor clients usually use OTC forward transactions that Ace must clear with a central counterparty. Which of the following statements related to the impact on Ace from clearing these positions is most accurate?

A. If Ace's counterparties enter long forward contracts whose prices are positively correlated with interest rates, Ace will have to post more collateral to central counterparties than for otherwise similar futures contracts, since rising prices will lead to counterparty MTM gains reinvested at higher rates.

B. If Ace's counterparties enter short forward contracts whose prices are negatively correlated with interest rates, Ace will have to post less collateral to central counterparties than for otherwise similar futures contracts, since falling prices will lead to counterparty MTM gains reinvested at higher rates.

C. Since Ace is required to post collateral (cash or highly liquid securities) to the central counterparty to clear its client forward transactions, Ace will face similar margining requirements to those of standardized exchange-traded futures markets.

PRACTICE PROBLEMS

Ace Limited is a financial intermediary that is active in forward and swap markets with its issuer and investor clients. You have been asked to consult on a number of client situations to determine the best course of action.

1. Identify which of the following statements is associated with which Ace counterparty swap position.

1. Ace's counterparty with this swap position will realize an MTM gain if implied forward rates rise.	A. A receive-fixed interest rate swap
2. Ace's counterparty with this swap position will make a net payment if the initial market reference rate sets above the fixed swap rate.	B. A pay-fixed interest rate swap
3. Ace's counterparty with this position will face an initial swap contract value (ignoring transaction and counterparty credit costs) of zero.	C. Both a receive-fixed and a pay-fixed interest rate swap

2. Ace's client is an asset manager with a significant portion of its fixed-rate bond investment portfolio maturing soon. Ace intends to reinvest the proceeds in five-year bond maturities. Which of the following describes the *best* course of action in the derivatives market for Ace's client to address its bond reinvestment risk?

A. Ace's client should consider *receiving* fixed on a cash-settled five-year forward-starting swap that starts and settles in three months in order to best address its bond reinvestment risk.

B. Ace's client should consider *paying* fixed on a cash-settled five-year forward-starting swap starting in three months in order to best address its bond reinvestment risk.

C. Ace's client should consider entering a *series* of forward rate agreements (FRAs) from today until five years from now under which it pays a fixed rate and receives a floating rate each period ending in five years to address its bond reinvestment risk.

3. Ace enters a 10-year GBP interest rate swap with a client in which Ace receives an initial six-month GBP MRR of 1.75% and pays a fixed GBP swap rate of 3.10% for the first semiannual period. Which of the following statements best describes the value of the swap from Ace's perspective three months after the inception of the trade?

A. Ace has an MTM *loss* on the swap, because it owes a net settlement payment to its counterparty equal to 1.35% multiplied by the notional and period.

B. Ace has an MTM *gain* on the swap, because once it makes the first known net payment to its counterparty, the remainder of the future net fixed versus floating cash flows must have a positive present value from Ace's perspective.

C. While the present value of fixed and future cash flows was set to zero by solving for the swap rate at inception, we do not have enough information to determine whether the swap currently has a positive or negative value from Ace's perspective following inception.

4. At time $t = 0$, Ace observes the following zero rates over three periods:

Periods	Zero Rates
1	2.2727%
2	3.0323%
3	3.6355%

Which of the following best describes how Ace arrives at a three-period par swap rate (s_3)?

A. Since the par swap rate represents the fixed rate at which the present value of fixed and future cash flows equal one another, we discount each zero rate back to the present using zero rates and solve for s_3 to get 2.961%.

B. Since the par swap rate represents the fixed rate at which the present value of fixed and future cash flows equal one another, we first solve for the implied forward rate per period using zero rates, then discount each implied forward rate back to the present using zero rates, and solve for s_3 to get 3.605%.

C. Since the par swap rate represents the fixed rate at which the present value of fixed and future cash flows equal one another, we first solve for the implied forward rate per period using zero rates, then discount each zero rate back to the present using implied forward rates, and solve for s_3 to get 3.009%.

5. Ace's issuer client has swapped its outstanding fixed-rate debt to floating to match asset portfolio cash flows that generate an MRR-based return. Which of the following statements *best* describes how Ace's MTM credit exposure to the issuer changes if interest rates rise immediately following trade inception?

A. Since the client receives fixed and pays floating swap, it faces an MTM loss on the transaction as rates rise, *increasing* Ace's MTM exposure to the client.

B. Since the client receives fixed and pays floating swap, it faces an MTM gain on the transaction as rates rise, *decreasing* Ace's MTM exposure to the client.

C. Since the swap's value is equal to the current settlement plus future expected settlement amounts, we do not have enough information to determine whether Ace's MTM exposure to the client increases or decreases.

PRACTICE PROBLEMS

The Viswan Family Office (VFO) owns non-dividend-paying shares of Biomian Limited that are currently priced (S_0) at INR 295 per share. VFO's CIO is considering an offer to sell shares at a forward price ($F_0(T)$) of INR 300.84 per share in six months based on a risk-free rate of 4%. You have been asked to advise on the purchase of a put option or the sale of a call option with an exercise price (X) equal to the forward price ($F_0(T)$) as alternatives to a forward share sale.

1. VFO is considering the purchase of the put option to hedge against a decline in Biomian's share price. Which of the following statements best characterizes the trade-off between the put and the forward based on no-arbitrage pricing?

   A. The gain on the forward sale will *equal* the purchased put option's profit at maturity *provided* the put option ends up in the money at maturity.

   B. The loss on the forward sale will *exceed* the loss on the purchased put at maturity if Biomian's share price exceeds the forward price by more than the initial put premium paid.

   C. We do not have enough information to answer this question, since we do not know the time value of the option at maturity.

2. In evaluating the purchased put strategy (with $X = F_0(T)$), the CIO has asked you to consider selling the put in three months' time if its price appreciates over that period. Which of the following best characterizes the no-arbitrage put price at that time?

   A. As VFO will exercise only if the spot price is below the exercise price, the lower bound of the put price is the greater of zero and the present value of the spot price minus the exercise price.

   B. As VFO will exercise only if the spot price is below the exercise price, the upper bound of the put price equals the present value of the exercise price minus the spot price.

   C. The put price can be no greater than the forward price and no less than the greater of zero and the present value of the exercise price minus the spot price.

3. VFO is considering a sold call strategy to generate income from the sale of a call. In your scenario analysis of the sold call option alternative, VFO has asked you to value the call option in three months' time if Biomian's spot price is INR 325 per share. Given an estimated call price of INR 46.41 at that time, which of the following correctly reflects the relationship between the call's exercise value and its time value?

   A. The call's exercise value is INR 24.16, and its time value is INR 22.25.

   B. The call's exercise value is INR 27.10, and its time value is INR 19.31.

   C. The call's exercise value is INR 20.99, and its time value is INR 25.42.

4. In comparing the sold call and purchased put strategies at the forward price, VFO's CIO is concerned about how an immediate increase in the volatility of

the underlying Biomian shares might affect option value. Which of the following statements about this volatility change and its effect on strategy is most accurate?

A. An increase in the volatility of the underlying shares has the *same* effect on call and put option values, so this change should not affect VFO's strategy decision.

B. Since changes in the volatility of the underlying shares have the *opposite* effect on put versus call options, this change will increase the attractiveness of the put strategy versus the call strategy.

C. An increase in the volatility of the underlying shares will increase both the *cost* of the purchased put strategy and the premium received on the sold call strategy, so this change will increase the attractiveness of the call strategy versus the put strategy.

5. In comparing the Biomian purchased put and sold call strategies, which of the following statements is most correct about how the call and put values are affected by changes in factors other than volatility?

A. Changes in the time to expiration and the risk-free rate have a similar directional effect on the put and call strategies, while changes in the exercise price tend to have the opposite effect.

B. Changes in the time to expiration tend to have a similar directional effect on the put and call strategies, while changes in the exercise price and the risk-free rate tend to have the opposite effect.

C. Changes in the risk-free rate have a similar directional effect on the put and call strategies, while changes in the exercise price and the time to expiration tend to have the opposite effect.

PRACTICE PROBLEMS

Privatbank Kleinert KGaA, a private wealth manager in Munich, has a number of clients with large holdings in the German fintech firm SparCoin AG. Kleinert's analyst is concerned about a drop in SparCoin's share price in the next year and is recommending to clients that they consider purchasing a one-year put with an exercise price of €100. SparCoin's spot price (S_0) is €105.25, and it pays no dividends. The risk-free rate is 0.37%.

1. Kleinert's analyst estimates a 50-50 chance that the price of SparCoin will either increase by 12% or decline by 10% at the put option's expiration date. Which of the following statements best describes the no-arbitrage option price implied by this assumption?

   A. Since there is a 50% chance that the stock will fall to €94.73, there is a 50-50 chance of a €5.27 payout upon exercise and the no-arbitrage put is therefore worth €2.64 (= €5.27 / 2).

   B. Since there is a 50% chance that the stock will fall to €94.73, there is a 50-50 chance of a €5.27 payout upon exercise and given the risk-neutral probability of 0.47, the no-arbitrage put price is €2.48 (= €5.27 × 0.47).

   C. Since there is a 50% chance that the stock will fall to €94.73 and the risk-neutral probability is 0.47, the no-arbitrage put price is €2.78 (= €5.27 × {[1 − 0.47]/1.0037}).

2. If Kleinert's clients observe that the one-year put option with a €100 exercise price is trading at €2.50, which of the following statements best describes how Kleinert's clients could take advantage of this to earn a risk-free return greater than 0.37% over the year.

   A. Kleinert should purchase the put option and also purchase approximately 0.23 shares per option to match the hedge ratio.

   B. Kleinert should purchase the put option and purchase 50% of the underlying shares given the 50-50 chance the stock will fall and the put option exercised.

   C. Kleinert should purchase the put option and purchase 47% of the underlying shares to match the risk-neutral probability of put exercise.

3. If risk-free investments yielded a higher return over the next year, which of the following statements best describes how this would affect the no-arbitrage value of the put option on SparCoin shares?

   A. An increase in the risk-free rate will have *no effect* on SparCoin's put option price, as it is solely a function of the probability and degree of share price increase or decrease upon option expiration.

   B. An increase in the risk-free rate will *increase* the value of the put option, as it will increase the risk-neutral probability of a price decline.

   C. An increase in the risk-free rate will *decrease* the value of the put option, as it will both increase the risk-neutral probability of a price increase π and decrease the present value of the expected option payoff.

4. If the expected percentage increase and decrease in SparCoin's share price were to *double*, which of the following is the closest estimate of the one-year put option price with an exercise price of €100?

   A. The one-year put option price will rise to €7.90.

   B. The one-year put option price will rise to €8.50.

   C. The one-year put option price will rise to €7.40.

Alternative Investments

PRACTICE PROBLEMS

1. Which of the following is *least likely* to be considered an alternative investment?
   A. Real estate
   B. Commodities
   C. Long-only equity funds

2. An investor is seeking an investment that can take long and short positions, may use multi-strategies, and historically exhibits low correlation with a traditional investment portfolio. The investor's goals will be *best* satisfied with an investment in:
   A. real estate.
   B. a hedge fund.
   C. a private equity fund.

3. Relative to traditional investments, alternative investments are *least likely* to be characterized by:
   A. high levels of transparency.
   B. limited historical return data.
   C. significant restrictions on redemptions.

4. Alternative investment funds are typically managed:
   A. actively.
   B. to generate positive beta return.
   C. assuming that markets are efficient.

5. Compared with traditional investments, alternative investments are *more likely* to have:
   A. greater use of leverage.
   B. long-only positions in liquid assets.
   C. more transparent and reliable risk and return data.

6. The potential benefits of allocating a portion of a portfolio to alternative investments include:
   A. ease of manager selection.
   B. improvement in the portfolio's risk–return relationship.
   C. accessible and reliable measures of risk and return.

7. From the perspective of the investor, the *most* active approach to investing in alternative investments is:
   A. co-investing.

B. fund investing.

C. direct investing.

8. In comparison to other alternative investment approaches, co-investing is *most likely*:

A. more expensive.

B. subject to adverse selection bias.

C. the most flexible approach for the investor.

9. Relative to co-investing, direct investing due diligence is *most likely*:

A. harder to control.

B. more independent.

C. equally thorough.

10. The investment method that typically requires the *most* thorough due diligence from an investor is:

A. fund investing.

B. co-investing.

C. direct investing.

11. An alternative investment fund's hurdle rate is a:

A. rate unrelated to a catch-up clause.

B. tool to protect clients from paying twice for the same performance.

C. minimum rate of return the GP must exceed in order to earn a performance fee.

12. An investor in a private equity fund is concerned that the general partner can receive incentive fees in excess of the agreed-on incentive fees by making distributions over time based on profits earned rather than making distributions only at exit from investments of the fund. Which of the following is *most likely* to protect the investor from the general partner receiving excess fees?

A. high hurdle rate

B. clawback provision

C. lower capital commitment

13. Until the committed capital is fully drawn down and invested, the management fee for a private equity fund is based on:

A. invested capital.

B. committed capital.

C. assets under management.

14. The distribution method by which profits generated by a fund are allocated be-

tween LPs and the GP is called:

A. a waterfall.

B. an 80/20 split.

C. a fair division.

15. An American waterfall distributes performance fees on a(n) _____ basis and is more advantageous to the _____.

A. deal-by-deal; LPs

B. aggregate fund; LPs

C. deal-by-deal; GP

PRACTICE PROBLEMS

1. The Sharpe ratio is a less-than-ideal performance measure for alternative investments because:
   - **A.** it uses a semi-deviation measure of volatility.
   - **B.** returns of alternative assets are not normally distributed.
   - **C.** alternative assets exhibit low correlation with traditional asset classes.

2. Which of the following statements regarding private equity performance calculations is true?
   - **A.** The money multiple calculation relies on the amount and timing of cash flows.
   - **B.** The IRR calculation involves the assumption of two rates.
   - **C.** Because private equity funds have low volatility, accounting conventions allow them to use a lagged mark-to-market process.

3. Which of the following statements is *not* true of mark-to-model valuations?
   - **A.** Return volatility may be understated.
   - **B.** Returns may be smooth and overstated.
   - **C.** A calibrated model will produce a reliable liquidation value.

4. An analyst wanting to assess the downside risk of an alternative investment is *least likely* to use the investment's:
   - **A.** Sortino ratio.
   - **B.** value at risk (VaR).
   - **C.** standard deviation of returns.

5. The following performance data are provided for an alternative investment.

Average Annual Compounded Return

1 Year	3 Years	5 Years	Since Inception
5.3%	6.2%	4.7%	4.4%

Assume the maximum drawdown risk is steady at 10.2% over each time period. Assume the average drawdown risk is steady at 6.8% over each time period.

Using the data provided, calculate the Calmar ratio the way it is *typically* calculated. The Calmar ratio is the *closest* to:

- **A.** 0.46.
- **B.** 0.61.
- **C.** 0.65.

6. United Capital is a hedge fund with USD250 million of initial capital. United charges a 2% management fee based on assets under management at year end

and a 20% incentive fee based on returns in excess of an 8% hurdle rate. In its first year, United appreciates 16%. Assume management fees are calculated using end-of-period valuation. The investor's net return assuming the performance fee is calculated net of the management fee is *closest* to:

A. 11.58%.

B. 12.54%.

C. 12.80%.

7. Capricorn Fund of Funds invests GBP100 million in each of Alpha Hedge Fund and ABC Hedge Fund. Capricorn Fund of Funds has a "1 and 10" fee structure. Management fees and incentive fees are calculated independently at the end of each year. After one year, net of their respective management and incentive fees, Capricorn's investment in Alpha is valued at GBP80 million and Capricorn's investment in ABC is valued at GBP140 million. The annual return to an investor in Capricorn Fund of Funds, net of fees assessed at the fund-of-funds level, is *closest* to:

A. 7.9%.

B. 8.0%.

C. 8.1%.

8. The following information applies to Rotunda Advisers, a hedge fund:

- USD288 million in AUM as of prior year end
- 2% management fee (based on year-end AUM)
- 20% incentive fee calculated:
  - net of management fee
  - using a 5% soft hurdle rate
  - using a high-water mark (high-water mark is USD357 million)
- Current-year fund gross return is 25%.

The total fee earned by Rotunda in the current year is *closest* to:

A. USD7.20 million.

B. USD20.16 million.

C. USD21.60 million.

9. A hedge fund has the following fee structure:

Annual management fee based on year-end AUM	2%
Incentive fee	20%
Hurdle rate before incentive fee collection starts	4%
Current high-water mark	USD610 million

The fund has a value of USD583.1 million at the beginning of the year. After one year, it has a value of USD642 million before fees. The net percentage return to an investor for this year is *closest* to:

A. 6.72%.

B. 6.80%.

C. 7.64%.

PRACTICE PROBLEMS

1. A collateralized loan obligation specialist is *most likely* to:
   - **A.** sell its debt at a single interest rate.
   - **B.** cater to niche borrowers in specific situations.
   - **C.** rely on diverse risk profiles to complete deals.

2. Private capital is:
   - **A.** accurately described by the generic term "private equity."
   - **B.** a source of diversification benefits from both debt and equity.
   - **C.** predisposed to invest in both the debt and equity of a client's firm.

3. The first stage of financing at which a venture capital fund *most likely* invests is the:
   - **A.** seed stage.
   - **B.** mezzanine stage.
   - **C.** angel investing stage.

4. A private equity fund desiring to realize an immediate and complete cash exit from a portfolio company is *most likely* to pursue:
   - **A.** an IPO.
   - **B.** a trade sale.
   - **C.** a recapitalization.

5. Angel investing capital is typically provided in which stage of financing?
   - **A.** Later stage
   - **B.** Formative stage
   - **C.** Mezzanine stage

6. Private equity funds are *most likely* to use:
   - **A.** merger arbitrage strategies.
   - **B.** leveraged buyouts.
   - **C.** market-neutral strategies.

7. The majority of real estate property may be classified as either:
   - **A.** debt or equity.
   - **B.** commercial or residential.
   - **C.** direct ownership or indirect ownership.

8. Which of the following relates to a benefit when owning real estate directly?
   - **A.** Taxes
   - **B.** Capital requirements
   - **C.** Portfolio concentration

9. Which of the following statements regarding mortgage-backed securities is true?
   - **A.** Insurance companies prefer the first-loss tranche.
   - **B.** When interest rates rise, prepayments will likely accelerate.
   - **C.** When interest rates fall, the low-risk senior tranche will amortize more quickly.

10. Which of the following statements regarding REITs is true?
   - **A.** According to GAAP, equity REITs are exempt from reporting earnings per share.
   - **B.** Though equity REIT correlations with other asset classes are typically moderate, they are highest during steep market downturns.
   - **C.** The REIT corporation pays taxes on income, and the REIT shareholder pays taxes on the REIT's dividend distribution of after-tax earnings.

11. What is the *most* significant drawback of a repeat sales index to measure returns to real estate?
   - **A.** Sample selection bias
   - **B.** Understatement of volatility
   - **C.** Reliance on subjective appraisals

12. As the loan-to-value ratio increases for a real estate investment, risk *most likely* increases for:
   - **A.** debt investors only.
   - **B.** equity investors only.
   - **C.** both debt and equity investors.

13. Compared with direct investment in infrastructure, publicly traded infrastructure securities are characterized by:
   - **A.** higher concentration risk.
   - **B.** more transparent governance.
   - **C.** greater control over the infrastructure assets.

14. Which of the following forms of infrastructure investment is the *most* liquid?
   - **A.** An unlisted infrastructure mutual fund
   - **B.** A direct investment in a greenfield project
   - **C.** An exchange-traded MLP

15. An investor chooses to invest in a brownfield, rather than a greenfield, infrastructure project. The investor is *most likely* motivated by:

A. growth opportunities.

B. predictable cash flows.

C. higher expected returns.

16. The privatization of an existing hospital is best described as:

A. a greenfield investment.

B. a brownfield investment.

C. an economic infrastructure investment.

17. Risks in infrastructure investing are *most likely* greatest when the project involves:

A. construction of infrastructure assets.

B. investment in existing infrastructure assets.

C. investing in assets that will be leased back to a government.

18. A primary risk to investing in timber is *most likely* its:

A. high correlation with other asset classes.

B. dependence on an international competitive context.

C. return volatility compounded by financial market exposure.

19. A *significant* characteristic of farmland distinguishing it from timberland is its:

A. commodity price-driven returns.

B. less flexibility in timing of harvest.

C. value as an offset to other human activities.

20. Which of the following statements about commodity investing is invalid?

A. Few commodity investors trade actual physical commodities.

B. Commodity producers and consumers both hedge and speculate.

C. Commodity indexes are based on the price of physical commodities.

21. An investor seeks a current income stream as a component of total return and desires an investment that historically has low correlation with other asset classes. The investment *most likely* to achieve the investor's goals is:

A. timberland.

B. collectibles.

C. commodities.

22. If a commodity's forward curve is upward sloping and there is little or no conve-

nience yield, the market is said to be in:

A. backwardation.

B. contango.

C. equilibrium.

23. Which approach is *most commonly* used by equity hedge strategies?

A. Top down

B. Bottom up

C. Market timing

24. An investor may prefer a single hedge fund to a fund of funds if she seeks:

A. due diligence expertise.

B. better redemption terms.

C. a less complex fee structure.

25. Hedge funds are similar to private equity funds in that both:

A. are typically structured as partnerships.

B. assess management fees based on assets under management.

C. do not earn an incentive fee until the initial investment is repaid.

26. Both event-driven and macro hedge fund strategies use:

A. long–short positions.

B. a top-down approach.

C. long-term market cycles.

27. Hedge fund losses are *most likely* to be magnified by a:

A. margin call.

B. lockup period.

C. redemption notice period.

28. An equity hedge fund following a fundamental growth strategy uses fundamental analysis to identify companies that are *most likely* to:

A. be undervalued.

B. be either undervalued or overvalued.

C. experience high growth and capital appreciation.

Portfolio Management

PRACTICE PROBLEMS

1. Investors should use a portfolio approach to:
   - **A.** reduce risk.
   - **B.** monitor risk.
   - **C.** eliminate risk.

2. Which of the following is the *best* reason for an investor to be concerned with the composition of a portfolio?
   - **A.** Risk reduction.
   - **B.** Downside risk protection.
   - **C.** Avoidance of investment disasters.

3. With respect to the formation of portfolios, which of the following statements is *most accurate*?
   - **A.** Portfolios affect risk less than returns.
   - **B.** Portfolios affect risk more than returns.
   - **C.** Portfolios affect risk and returns equally.

4. With respect to the portfolio management process, the asset allocation is determined in the:
   - **A.** planning step.
   - **B.** feedback step.
   - **C.** execution step.

5. The planning step of the portfolio management process is *least likely* to include an assessment of the client's
   - **A.** securities.
   - **B.** constraints.
   - **C.** risk tolerance.

6. With respect to the portfolio management process, the rebalancing of a portfolio's composition is *most likely* to occur in the:
   - **A.** planning step.
   - **B.** feedback step.
   - **C.** execution step.

7. An analyst gathers the following information for the asset allocations of three portfolios:

Portfolio	Fixed Income (%)	Equity (%)	Alternative Assets (%)
1	25	60	15
2	60	25	15
3	15	60	25

Which of the portfolios is *most likely* appropriate for a client who has a high degree of risk tolerance?

A. Portfolio 1.

B. Portfolio 2.

C. Portfolio 3.

8. Which of the following institutions will *on average* have the greatest need for liquidity?

A. Banks.

B. Investment companies.

C. Non-life insurance companies.

9. Which of the following institutional investors will *most likely* have the longest time horizon?

A. Defined benefit plan.

B. University endowment.

C. Life insurance company.

10. A defined benefit plan with a large number of retirees is *likely* to have a high need for:

A. income.

B. liquidity.

C. insurance.

11. Which of the following institutional investors is *most likely* to manage investments in mutual funds?

A. Insurance companies.

B. Investment companies.

C. University endowments.

12. Which of the following investment products is *most likely* to trade at their net asset value per share?

A. Exchange traded funds.

B. Open-end mutual funds.

C. Closed-end mutual funds.

13. Which of the following financial products is *least likely* to have a capital gain distribution?

A. Exchange traded funds.

B. Open-end mutual funds.

C. Closed-end mutual funds.

14. Which of the following forms of pooled investments is subject to the *least* amount of regulation?

A. Hedge funds.

B. Exchange traded funds.

C. Closed-end mutual funds.

15. Which of the following pooled investments is *most likely* characterized by a few large investments?

A. Hedge funds.

B. Buyout funds.

C. Venture capital funds.

PRACTICE PROBLEMS

1. An investor purchased 100 shares of a stock for $34.50 per share at the beginning of the quarter. If the investor sold all of the shares for $30.50 per share after receiving a $51.55 dividend payment at the end of the quarter, the holding period return is *closest* to:

   A. −13.0%.

   B. −11.6%.

   C. −10.1%.

2. An analyst obtains the following annual rates of return for a mutual fund:

Year	Return (%)
2008	14
2009	−10
2010	−2

   The fund's holding period return over the three-year period is *closest* to:

   A. 0.18%.

   B. 0.55%.

   C. 0.67%.

3. An analyst observes the following annual rates of return for a hedge fund:

Year	Return (%)
2008	22
2009	−25
2010	11

   The hedge fund's annual geometric mean return is *closest* to:

   A. 0.52%.

   B. 1.02%.

   C. 2.67%.

4. Which of the following return calculating methods is *best* for evaluating the annualized returns of a buy-and-hold strategy of an investor who has made annual deposits to an account for each of the last five years?

   A. Geometric mean return.

   B. Arithmetic mean return.

   C. Money-weighted return.

5. An investor performs the following transactions on the shares of a firm.
   - At $t = 0$, she purchases a share for $1,000.

• At $t = 1$, she receives a dividend of $25 and then purchases three additional shares for $1,055 each.
• At $t = 2$, she receives a total dividend of $100 and then sells the four shares for $1,100 each.

The money-weighted rate of return is *closest* to:

A. 4.5%.

B. 6.9%.

C. 7.3%.

6. A fund receives investments at the beginning of each year and generates returns as shown in the table.

Year of Investment	Assets Under Management at the beginning of each year	Return during Year of Investment
1	$1,000	15%
2	$4,000	14%
3	$45,000	–4%

Which return measure over the three-year period is negative?

A. Geometric mean return

B. Time-weighted rate of return

C. Money-weighted rate of return

7. At the beginning of Year 1, a fund has $10 million under management; it earns a return of 14% for the year. The fund attracts another $100 million at the start of Year 2 and earns a return of 8% for that year. The money-weighted rate of return is *most likely*:

A. less than the time-weighted rate of return.

B. the same as the time-weighted rate of return.

C. greater than the time-weighted rate of return.

8. An investor evaluating the returns of three recently formed exchange-traded funds gathers the following information:

ETF	Time Since Inception	Return Since Inception (%)
1	146 days	4.61
2	5 weeks	1.10
3	15 months	14.35

The ETF with the highest annualized rate of return is:

A. ETF 1.

B. ETF 2.

C. ETF 3.

The following information relates to questions 9-10

An analyst observes the following historic geometric returns:

Asset Class	Geometric Return (%)
Equities	8.0
Corporate Bonds	6.5
Treasury bills	2.5
Inflation	2.1

9. The real rate of return for equities is *closest* to:

A. 5.4%.

B. 5.8%.

C. 5.9%.

10. The real rate of return for corporate bonds is *closest* to:

A. 4.3%.

B. 4.4%.

C. 4.5%.

11. The risk premium for equities is *closest* to:

A. 5.4%.

B. 5.5%.

C. 5.6%.

12. The risk premium for corporate bonds is *closest* to:

A. 3.5%.

B. 3.9%.

C. 4.0%.

13. With respect to trading costs, liquidity is *least likely* to impact the:

A. stock price.

B. bid–ask spreads.

C. brokerage commissions.

14. Evidence of risk aversion is *best* illustrated by a risk–return relationship that is:

A. negative.

B. neutral.

C. positive.

15. With respect to risk-averse investors, a risk-free asset will generate a numerical utility that is:

A. the same for all individuals.

B. positive for risk-averse investors.

C. equal to zero for risk seeking investors.

16. With respect to utility theory, the most risk-averse investor will have an indifference curve with the:

A. most convexity.

B. smallest intercept value.

C. greatest slope coefficient.

17. With respect to an investor's utility function expressed as: $U = E(r) - \frac{1}{2}A\sigma^2$, which of the following values for the measure for risk aversion has the *least* amount of risk aversion?

A. −4.

B. 0.

C. 4.

The following information relates to questions 18-19

A financial planner has created the following data to illustrate the application of utility theory to portfolio selection:

Investment	Expected Return (%)	Expected Standard Deviation (%)
1	18	2
2	19	8
3	20	15
4	18	30

18. A risk-neutral investor is *most likely* to choose:

A. Investment 1.

B. Investment 2.

C. Investment 3.

19. If an investor's utility function is expressed as $U = E(r) - \frac{1}{2}A\sigma^2$ and the measure for risk aversion has a value of −2, the risk-seeking investor is *most likely* to choose:

A. Investment 2.

B. Investment 3.

C. Investment 4.

20. If an investor's utility function is expressed as $U = E(r) - \frac{1}{2}A\sigma^2$ and the measure for risk aversion has a value of 2, the risk-averse investor is *most likely* to choose:

A. Investment 1.

B. Investment 2.

C. Investment 3.

21. If an investor's utility function is expressed as $U = E(r) - \frac{1}{2}A\sigma^2$ and the measure for risk aversion has a value of 4, the risk-averse investor is *most likely* to choose:

A. Investment 1.

B. Investment 2.

C. Investment 3.

22. With respect to the mean–variance portfolio theory, the capital allocation line, CAL, is the combination of the risk-free asset and a portfolio of all:

A. risky assets.

B. equity securities.

C. feasible investments.

23. Two individual investors with different levels of risk aversion will have optimal portfolios that are:

A. below the capital allocation line.

B. on the capital allocation line.

C. above the capital allocation line.

24. With respect to capital market theory, which of the following asset characteristics is *least likely* to impact the variance of an investor's equally weighted portfolio?

A. Return on the asset.

B. Standard deviation of the asset.

C. Covariances of the asset with the other assets in the portfolio.

25. A portfolio manager creates the following portfolio:

Security	Security Weight (%)	Expected Standard Deviation (%)
1	30	20
2	70	12

If the correlation of returns between the two securities is 0.40, the expected standard deviation of the portfolio is *closest* to:

A. 10.7%.

B. 11.3%.

C. 12.1%.

26. A portfolio manager creates the following portfolio:

Security	Security Weight (%)	Expected Standard Deviation (%)
1	30	20
2	70	12

If the covariance of returns between the two securities is –0.0240, the expected standard deviation of the portfolio is *closest* to:

A. 2.4%.

B. 7.5%.

C. 9.2%.

The following information relates to questions 27-28

A portfolio manager creates the following portfolio:

Security	Security Weight (%)	Expected Standard Deviation (%)
1	30	20
2	70	12

27. If the standard deviation of the portfolio is 14.40%, the correlation between the two securities is equal to:

A. –1.0.

B. 0.0.

C. 1.0.

28. If the standard deviation of the portfolio is 14.40%, the covariance between the two securities is equal to:

A. 0.0006.

B. 0.0240.

C. 1.0000.

The following information relates to questions 29-31

A portfolio manager creates the following portfolio:

Security	Expected Annual Return (%)	Expected Standard Deviation (%)
1	16	20
2	12	20

29. If the portfolio of the two securities has an expected return of 15%, the proportion invested in Security 1 is:

A. 25%.

B. 50%.

C. 75%.

30. If the correlation of returns between the two securities is –0.15, the expected standard deviation of an equal-weighted portfolio is *closest* to:

A. 13.04%.

B. 13.60%.

C. 13.87%.

31. If the two securities are uncorrelated, the expected standard deviation of an equal-weighted portfolio is *closest* to:

A. 14.00%.

B. 14.14%.

C. 20.00%.

The following information relates to questions 32-33

An analyst has made the following return projections for each of three possible outcomes with an equal likelihood of occurrence:

Asset	Outcome 1 (%)	Outcome 2 (%)	Outcome 3 (%)	Expected Return (%)
1	12	0	6	6
2	12	6	0	6
3	0	6	12	6

32. If the analyst constructs two-asset portfolios that are equally-weighted, which pair of assets has the *lowest* expected standard deviation?

A. Asset 1 and Asset 2.

B. Asset 1 and Asset 3.

C. Asset 2 and Asset 3.

33. If the analyst constructs two-asset portfolios that are equally weighted, which pair of assets provides the *least* amount of risk reduction?

A. Asset 1 and Asset 2.

B. Asset 1 and Asset 3.

C. Asset 2 and Asset 3.

34. As the number of assets in an equally-weighted portfolio increases, the contribution of each individual asset's variance to the volatility of the portfolio:

A. increases.

B. decreases.

C. remains the same.

35. With respect to an equally weighted portfolio made up of a large number of assets, which of the following contributes the *most* to the volatility of the portfolio?

A. Average variance of the individual assets.

B. Standard deviation of the individual assets.

C. Average covariance between all pairs of assets.

36. The correlation between assets in a two-asset portfolio increases during a market decline. If there is no change in the proportion of each asset held in the portfolio or the expected standard deviation of the individual assets, the volatility of the portfolio is *most likely* to:

A. increase.

B. decrease.

C. remain the same.

37. Which of the following statements is *least* accurate? The efficient frontier is the set of all attainable risky assets with the:

A. highest expected return for a given level of risk.

B. lowest amount of risk for a given level of return.

C. highest expected return relative to the risk-free rate.

38. The portfolio on the minimum-variance frontier with the lowest standard deviation is:

A. unattainable.

B. the optimal risky portfolio.

C. the global minimum-variance portfolio.

39. The set of portfolios on the minimum-variance frontier that dominates all sets of

portfolios below the global minimum-variance portfolio is the:

A. capital allocation line.

B. Markowitz efficient frontier.

C. set of optimal risky portfolios.

40. The dominant capital allocation line is the combination of the risk-free asset and the:

A. optimal risky portfolio.

B. levered portfolio of risky assets.

C. global minimum-variance portfolio.

41. Compared to the efficient frontier of risky assets, the dominant capital allocation line has higher rates of return for levels of risk greater than the optimal risky portfolio because of the investor's ability to:

A. lend at the risk-free rate.

B. borrow at the risk-free rate.

C. purchase the risk-free asset.

42. With respect to the mean–variance theory, the optimal portfolio is determined by each individual investor's:

A. risk-free rate.

B. borrowing rate.

C. risk preference.

PRACTICE PROBLEMS

1. The line depicting the total risk and expected return of portfolio combinations of a risk-free asset and any risky asset is the:
   A. security market line.
   B. capital allocation line.
   C. security characteristic line.

2. The portfolio of a risk-free asset and a risky asset has a better risk-return tradeoff than investing in only one asset type because the correlation between the risk-free asset and the risky asset is equal to:
   A. –1.0.
   B. 0.0.
   C. 1.0.

3. With respect to capital market theory, an investor's optimal portfolio is the combination of a risk-free asset and a risky asset with the highest:
   A. expected return.
   B. indifference curve.
   C. capital allocation line slope.

4. Highly risk-averse investors will *most likely* invest the majority of their wealth in:
   A. risky assets.
   B. risk-free assets.
   C. the optimal risky portfolio.

5. The capital market line (CML) is the graph of the risk and return of portfolio combinations consisting of the risk-free asset and:
   A. any risky portfolio.
   B. the market portfolio.
   C. the leveraged portfolio.

6. Which of the following statements *most accurately* defines the market portfolio in capital market theory? The market portfolio consists of all:
   A. risky assets.
   B. tradable assets.
   C. investable assets.

7. With respect to capital market theory, the optimal risky portfolio:
   A. is the market portfolio.

B. has the highest expected return.

C. has the lowest expected variance.

8. Relative to portfolios on the CML, any portfolio that plots above the CML is considered:

A. inferior.

B. inefficient.

C. unachievable.

9. A portfolio on the capital market line with returns greater than the returns on the market portfolio represents a(n):

A. lending portfolio.

B. borrowing portfolio.

C. unachievable portfolio.

10. With respect to the capital market line, a portfolio on the CML with returns less than the returns on the market portfolio represents a(n):

A. lending portfolio.

B. borrowing portfolio.

C. unachievable portfolio.

11. Which of the following types of risk is *most likely* avoided by forming a diversified portfolio?

A. Total risk.

B. Systematic risk.

C. Nonsystematic risk.

12. Which of the following events is *most likely* an example of nonsystematic risk?

A. A decline in interest rates.

B. The resignation of chief executive officer.

C. An increase in the value of the US dollar.

13. With respect to the pricing of risk in capital market theory, which of the following statements is *most accurate*?

A. All risk is priced.

B. Systematic risk is priced.

C. Nonsystematic risk is priced.

14. The sum of an asset's systematic variance and its nonsystematic variance of returns is equal to the asset's:

A. beta.

B. total risk.

C. total variance.

The following information relates to questions 15-17

An analyst gathers the following information:

Security	Expected Annual Return (%)	Expected Standard Deviation (%)	Correlation between Security and the Market
Security 1	11	25	0.6
Security 2	11	20	0.7
Security 3	14	20	0.8
Market	10	15	1.0

15. Which security has the *highest* total risk?

A. Security 1.

B. Security 2.

C. Security 3.

16. Which security has the *highest* beta measure?

A. Security 1.

B. Security 2.

C. Security 3.

17. Which security has the *least* amount of market risk?

A. Security 1.

B. Security 2.

C. Security 3.

18. With respect to return-generating models, the intercept term of the market model is the asset's estimated:

A. beta.

B. alpha.

C. variance.

19. With respect to return-generating models, the slope term of the market model is an estimate of the asset's:

A. total risk.

B. systematic risk.

C. nonsystematic risk.

20. With respect to return-generating models, which of the following statements is *most accurate*? Return-generating models are used to directly estimate the:

A. expected return of a security.

B. weights of securities in a portfolio.

C. parameters of the capital market line.

21. With respect to capital market theory, the average beta of all assets in the market is:

A. less than 1.0.

B. equal to 1.0.

C. greater than 1.0.

22. With respect to the capital asset pricing model, the primary determinant of expected return of an individual asset is the:

A. asset's beta.

B. market risk premium.

C. asset's standard deviation.

23. With respect to the capital asset pricing model, which of the following values of beta for an asset is *most likely* to have an expected return for the asset that is less than the risk-free rate?

A. –0.5

B. 0.0

C. 0.5

24. With respect to the capital asset pricing model, the market risk premium is:

A. less than the excess market return.

B. equal to the excess market return.

C. greater than the excess market return.

25. The graph of the capital asset pricing model is the:

A. capital market line.

B. security market line.

C. security characteristic line.

26. With respect to capital market theory, correctly priced individual assets can be plotted on the:

A. capital market line.

B. security market line.

C. capital allocation line.

The following information relates to questions 27-30

An analyst gathers the following information:

Security	Expected Standard Deviation (%)	Beta
Security 1	25	1.50
Security 2	15	1.40
Security 3	20	1.60

27. With respect to the capital asset pricing model, if the expected market risk premium is 6% and the risk-free rate is 3%, the expected return for Security 1 is *closest* to:

A. 9.0%.

B. 12.0%.

C. 13.5%.

28. With respect to the capital asset pricing model, if expected return for Security 2 is equal to 11.4% and the risk-free rate is 3%, the expected return for the market is *closest* to:

A. 8.4%.

B. 9.0%.

C. 10.3%.

29. With respect to the capital asset pricing model, if the expected market risk premium is 6% the security with the *highest* expected return is:

A. Security 1.

B. Security 2.

C. Security 3.

30. With respect to the capital asset pricing model, a decline in the expected market return will have the *greatest* impact on the expected return of:

A. Security 1.

B. Security 2.

C. Security 3.

31. With respect to capital market theory, which of the following statements *best*

describes the effect of the homogeneity assumption? Because all investors have the same economic expectations of future cash flows for all assets, investors will invest in:

A. the same optimal risky portfolio.

B. the Standard and Poor's 500 Index.

C. assets with the same amount of risk.

32. With respect to capital market theory, which of the following assumptions allows for the existence of the market portfolio? All investors:

A. are price takers.

B. have homogeneous expectations.

C. plan for the same, single holding period.

33. Three equity fund managers have performance records summarized in the following table:

	Mean Annual Return (%)	Standard Deviation of Return (%)
Manager 1	14.38	10.53
Manager 2	9.25	6.35
Manager 3	13.10	8.23

Given a risk-free rate of return of 2.60%, which manager performed best based on the Sharpe ratio?

A. Manager 1

B. Manager 2

C. Manager 3

34. Which of the following performance measures is consistent with the CAPM?

A. M^2.

B. Sharpe ratio.

C. Jensen's alpha.

35. Which of the following performance measures does *not* require the measure to be compared to another value?

A. Sharpe ratio.

B. Treynor ratio.

C. Jensen's alpha.

36. Which of the following performance measures is *most* appropriate for an investor who is *not* fully diversified?

A. M^2.

B. Treynor ratio.

C. Jensen's alpha.

37. The slope of the security characteristic line is an asset's:

A. beta.

B. excess return.

C. risk premium.

38. Analysts who have estimated returns of an asset to be greater than the expected returns generated by the capital asset pricing model should consider the asset to be:

A. overvalued.

B. undervalued.

C. properly valued.

39. The intercept of the best fit line formed by plotting the excess returns of a manager's portfolio on the excess returns of the market is *best* described as Jensen's:

A. beta.

B. ratio.

C. alpha.

40. Portfolio managers who are maximizing risk-adjusted returns will seek to invest *more* in securities with:

A. lower values of Jensen's alpha.

B. values of Jensen's alpha equal to 0.

C. higher values of Jensen's alpha.

41. Portfolio managers, who are maximizing risk-adjusted returns, will seek to invest *less* in securities with:

A. lower values for nonsystematic variance.

B. values of nonsystematic variance equal to 0.

C. higher values for nonsystematic variance.