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 Private equity funds are *most likely* to use:

A merger arbitrage strategies.

B leveraged buyouts.

C market-neutral strategies.

3 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.

4 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.

5 Alternative investment funds are typically managed:

A actively.

B to generate positive beta return.

C assuming that markets are efficient.

6 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.

7 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.

8 An investor may prefer a single hedge fund to a fund of funds if he seeks:

A due diligence expertise.

B better redemption terms.

C a less complex fee structure.

9 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.

10 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.

11 Both event-driven and macro hedge fund strategies use:

A long–short positions.

B a top-down approach.

C long-term market cycles.

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

A margin call.

B lockup period.

C redemption notice period.

13 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.

14 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

15 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.

16 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.

17 Which of the following is most likely to be available when conducting hedge fund due diligence?

A The benchmark used by the fund

B Information on systems risk management

C Details of investment strategies and processes

18 A private equity fund desiring to realize an immediate and complete cash exit from a portfolio company is *most likely* to pursue a(n):

A IPO.

B trade sale.

C recapitalization.

19 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.

20 Which of the following forms of infrastructure investments is the most liquid?

A An unlisted infrastructure mutual fund

B A direct investment in a greenfield project

C An exchange-traded master limited partnership (MLP)

21 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.

22 The privatization of an existing hospital is best described as:

A a greenfield investment.

B a brownfield investment.

C an economic infrastructure investment.

23 A hedge fund invests primarily in distressed debt. Quoted market prices are available for the underlying holdings but they trade infrequently. Which of the following will the hedge fund *most likely* use in calculating net asset value for trading purposes?

A Average quotes

B Average quotes adjusted for liquidity

C Bid prices for short positions and ask prices for long positions

24 Angel investing capital is typically provided in which stage of financing?

A Later-stage.

B Formative-stage.

C Mezzanine-stage.

25 If a commodity's forward curve is in contango, the component of a commodities futures return *most likely* to reflect this is:

A spot prices.

B the roll yield.

C the collateral yield.

26 United Capital is a hedge fund with $250 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%.

27 Capricorn Fund of Funds invests GBP 100 million in each of Alpha Hedge Fund and ABC Hedge Fund. Capricorn FOF 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, the investment in Alpha is valued at GBP80 million and the investment in ABC is valued at GBP140 million. The annual return to an investor in Capricorn, net of fees assessed at the fund of funds level, is *closest* to:

A 7.9%.

B 8.0%.

C 8.1%.

28 The following information applies to Rotunda Advisors, a hedge fund:

- $288 million in assets under management (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 $357 million)
- Current year fund return is 25%

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

A $7.20 million.

B $20.16 million.

C $21.60 million.

29 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	$610 million

The fund has a value of $583.1 million at the beginning of the year. After one year, it has a value of $642 million before fees. The net return to an investor for this year is *closest* to:

A 6.72%.

B 6.80%.

C 7.64%.

30 Ash Lawn Partners, a fund of hedge funds, has the following fee structure:

- 2/20 underlying fund fees with incentive fees calculated independently
- Ash Lawn fees are calculated net of all underlying fund fees
- 1% management fee (based on year-end market value)
- 10% incentive fee calculated net of management fee
- The fund and all underlying funds have no hurdle rate or high-water mark fee conditions

In the latest year, Ash Lawn's fund value increased from $100 million to $133 million before deduction of management and incentive fees of the fund or underlying funds. Based on the information provided, the total fee earned by *all* funds in the aggregate is *closest* to:

A $11.85 million.

B \$12.75 million.

C \$12.87 million.

31 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.

32 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 likey to protect the investor from the general partner receiving excess fees?

A A high hurdle rate

B A clawback provision

C A lower capital commitment

33 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.

34 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.

35 An effective risk management process used by alternative investment funds *most likely* includes:

A in-house valuations.

B internal custody of assets.

C segregation of risk and investment process duties.

SOLUTIONS

1 C is correct. Long-only equity funds are typically considered traditional investments and real estate and commodities are typically classified as alternative investments.

2 B is correct. The majority of private equity activity involves leveraged buyouts. Merger arbitrage and market neutral are strategies used by hedge funds.

3 B is correct. Hedge funds may use a variety of strategies (event-driven, relative value, macro and equity hedge), generally have a low correlation with traditional investments, and may take long and short positions.

4 A is correct. Alternative investments are characterized as typically having low levels of transparency.

5 A is correct. There are many approaches to managing alternative investment funds but typically these funds are actively managed.

6 A is correct. Investing in alternative investments is often pursued through such special vehicles as hedge funds and private equity funds, which have flexibility to use leverage. Alternative investments include investments in such assets as real estate, which is an illiquid asset, and investments in such special vehicles as private equity and hedge funds, which may make investments in illiquid assets and take short positions. Obtaining information on strategies used and identifying reliable measures of risk and return are challenges of investing in alternatives.

7 B is correct. Adding alternative investments to a portfolio may provide diversification benefits because of these investments' less than perfect correlation with other assets in the portfolio. As a result, allocating a portion of one's funds to alternatives could potentially result in an improved risk–return relationship. Challenges to allocating a portion of a portfolio to alternative investments include obtaining reliable measures of risk and return as well as selecting portfolio managers for the alternative investments.

8 C is correct. Hedge funds of funds have multi-layered fee structures, while the fee structure for a single hedge fund is less complex. Funds of funds presumably have some expertise in conducting due diligence on hedge funds and may be able to negotiate more favorable redemption terms than could an individual investor in a single hedge fund.

9 A is correct. Private equity funds and hedge funds are typically structured as partnerships where investors are limited partners (LP) and the fund is the general partner (GP). The management fee for private equity funds is based on committed capital whereas for hedge funds the management fees are based on assets under management. For most private equity funds, the general partner does not earn an incentive fee until the limited partners have received their initial investment back.

10 A is correct. Timberland offers an income stream based on the sale of timber products as a component of total return and has historically generated returns not highly correlated with other asset classes.

11 A is correct. Long–short positions are used by both types of hedge funds to potentially profit from anticipated market or security moves. Event-driven strategies use a bottom-up approach and seek to profit from short-term events typically involving a corporate action, such as an acquisition or a restructuring. Macro strategies seek to profit from expected movements in evolving economic variables.

12 A is correct. Margin calls can magnify losses. To meet the margin call, the hedge fund manager may be forced to liquidate a losing position in a security, which, depending on the position size, could exert further price pressure on the security, resulting in further losses. Restrictions on redemptions, such as lockup and notice periods, may allow the manager to close positions in a more orderly manner and minimize forced-sale liquidations of losing positions.

13 A is correct. The seed stage supports market research and product development and is generally the first stage at which venture capital funds invest. The seed stage follows the angel investing stage. In the angel investing stage, funds are typically provided by individuals (often friends or family), rather than a venture capital fund, to assess an idea's potential and to transform the idea into a plan. Mezzanine-stage financing is provided by venture capital funds to prepare the portfolio company for its IPO.

14 A is correct. A repeat sales index uses the changes in price of repeat-sale properties to construct the index. Sample selection bias is a significant drawback because the properties that sell in each period vary and may not be representative of the overall market the index is meant to cover. The properties that transact are not a random sample and may be biased toward properties that changed in value. Understated volatility and reliance on subjective appraisals by experts are drawbacks of an appraisal index.

15 B is correct. Publicly traded infrastructure securities, which include shares of companies, exchange-traded funds, and listed funds that invest in infrastructure, provide the benefits of transparent governance, liquidity, reasonable fees, market prices, and the ability to diversify across underlying assets. Direct investment in infrastructure involves a large capital investment in any single project, resulting in high concentration risks. Direct investment in infrastructure provides control over the assets and the opportunity to capture the assets' full value.

16 C is correct. Fundamental growth strategies take long positions in companies identified, using fundamental analysis, to have high growth and capital appreciation. Fundamental value strategies use fundamental analysis to identify undervalued companies. Market-neutral strategies use quantitative and/or fundamental analysis to identify under- and overvalued companies.

17 A is correct. It should be possible to identify the benchmark against which the fund gauges its performance in the hedge fund due diligence process. It should also be possible to establish the range of markets in which the fund invests as well as the fund's general strategy. Hedge funds consider their strategies, systems, and processes to be proprietary and are unwilling to provide much information to potential investors.

18 B is correct. Private equity funds can realize an immediate cash exit in a trade sale. Using this strategy, the portfolio company is typically sold to a strategic buyer.

19 C is correct. The higher the loan-to-value ratio, the higher leverage is for a real estate investment, which increases the risk to both debt and equity investors.

20 C is correct. A publicly traded infrastructure security, such as an exchange-traded MLP, provides the benefit of liquidity.

21 B is correct. A brownfield investment is an investment in an existing infrastructure asset, which is more likely to have a history of steady cash flows compared with that of a greenfield investment. Growth opportunities and returns are expected to be lower for brownfield investments, which are less risky than greenfield investments.

22 B is correct. Investing in an existing infrastructure asset with the intent to privatize, lease, or sell and lease back the asset is referred to as a brownfield investment. An economic infrastructure asset supports economic activity and includes such assets as transportation and utility assets. Hospitals are social infrastructure assets, which are focused on human activities.

23 B is correct. Many practitioners believe that liquidity discounts are necessary to reflect fair value. This has resulted in some funds having two NAVs - for trading and reporting. The fund may use average quotes for reporting purposes but apply liquidity discounts for trading purposes.

24 B is correct. Formative-stage financing occurs when the company is still in the process of being formed and encompasses several financing steps. Angel investing capital is typically raised in this early stage of financing.

25 B is correct. Roll yield refers to the difference between the spot price of a commodity and the price specified by its futures contract (or the difference between two futures contracts with different expiration dates). When futures prices are higher than the spot price, the commodity forward curve is upward sloping, and the prices are referred to as being in contango. Contango occurs when there is little or no convenience yield.

26 B is correct. The net investor return is 12.54%, calculated as:

End of year capital = \$250 million × 1.16 = \$290 million

Management fee = \$290 million × 2% = \$5.8 million

Hurdle amount = 8% of \$250 million = \$20 million;

Incentive fee = (\$290 – \$250 – \$20 – \$5.8) million × 20% = \$2.84 million

Total fees to United Capital = (\$5.8 + \$2.84) million = \$8.64 million

Investor net return: (\$290 – \$250 – \$8.64) / \$250 = 12.54%

27 A is correct because the net investor return is 7.9%, calculated as:

First, note that “1 and 10” refers to a 1% management fee, and a 10% incentive fee.

End of year capital = GBP140 million + GBP80 million = GBP220 million

Management fee = GBP220 million × 1% = GBP2.2 million

Incentive fee = (GBP220 – GBP200) million × 10% = GBP2 million

Total fees to Capricorn = (GBP2.2 + GBP2) million = GBP4.2 million

Investor net return: (GBP220 – GBP200 – GBP4.2) / GBP200 = 7.9%

28 A is correct. Rotunda earns a management fee of \$7.20 million but does not earn an incentive fee because the year-end fund value net of management fee does not exceed the high-water mark of \$357 million.

Rotunda fees:

End-of-year AUM = Prior year-end AUM × (1 + Fund return) = \$288 million × 1.25 = \$360 million

\$360 million × 2% = \$7.20 million management fee

\$360 million – \$7.2 million = \$352.8 million AUM net of management fee

The year-end AUM net of fees does not exceed the \$357 million high-water mark. Therefore, no incentive fee is earned.

29 C is correct. The management fee for the year is

$$\$642 \times 0.02 = \$12.84 \text{ million.}$$

Because the ending value exceeds the high-water mark, the hedge fund can collect an incentive fee. The incentive fee is

$$\{\$642 - [\$610 \times (1 + 0.04)]\} \times 0.20 = \$1.52 \text{ million.}$$

The net return to the investor for the year is

$$[(\$642 - \$12.84 - \$1.52)/\$583.1] - 1 \approx 0.07638 \approx 7.64\%.$$

30 B is correct. Total fees paid to all funds (underlying funds and Ash Lawn) are \$12.75 million, consisting of underlying fund fees of \$9.26 million and Ash Lawn fees of \$3.49 million, calculated as follows:

Underlying fund fees:

Management fee = \$133 million × 0.02 = \$2.66 million.

Incentive fee = (\$133 – \$100) million × 0.20 = \$6.60 million.

Total underlying fund fees (\$2.66 + \$6.60) million = \$9.26 million.

Ash Lawn fees:

AUM at end of year, net of underlying fund fees = \$133 million – \$9.26 million = \$123.74 million.

Ash Lawn management fee = \$123.74 million × 0.01 = \$1.24 million (rounded).

AUM net of underlying fund fees and Ash Lawn management fee = (\$123.74 – \$1.24) million = \$122.50 million (rounded).

Ash Lawn incentive fee = (\$122.50 – \$100) million × 0.10 = \$2.25 million (rounded).

Total Ash Lawn fees = (\$1.24 + \$2.25) million = \$3.49 million (rounded).

Total fees of underlying funds and Ash Lawn:

(\$9.26 + \$3.49) million = \$12.75 million (rounded).

31 A is correct. Infrastructure projects involving construction have more risk than investments in existing assets with a demonstrated cash flow or investments in assets that are expected to generate regular cash flows because the assets will be leased back to a government.

32 B is correct. A clawback provision requires the general partner in a private equity fund to return any funds distributed (to the general partner) as incentive fees until the limited partners have received back their initial investments and the contracted portion of the total profits. A high hurdle rate will result in distributions occurring only after the fund achieves a specified return. A high hurdle rate decreases the likelihood of, but does not prevent, excess distributions. Management fees, not incentive fees, are based on committed capital.

33 B is correct. Until the committed capital is fully drawn down and invested, the management fee for a private equity fund is based on committed capital, not invested capital.

34 C is correct. Downside risk measures focus on the left side of the return distribution curve where losses occur. The standard deviation of returns assumes that returns are normally distributed. Many alternative investments do not exhibit

close-to-normal distribution of returns, which is a crucial assumption for the validity of a standard deviation as a comprehensive risk measure. Assuming normal probability distributions when calculating these measures will lead to an underestimation of downside risk for a negatively skewed distribution. Both the Sortino ratio and the value-at-risk measure are both measures of downside risk.

35 C is correct. Investment risk should be monitored by a chief risk officer who is separated from the investment process. Risk factors monitored include leverage, sector, and individual position limits as well as counterparty risks. Independent (as opposed to in-house) valuation of underlying positions should be performed and reviewed on a regular basis. Third-party custody of assets can help reduce the chance of fraud.

Portfolio Management

STUDY SESSION

Study Session 18	Portfolio Management (1)
Study Session 19	Portfolio Management (2)

TOPIC LEVEL LEARNING OUTCOME

The candidate should be able to explain and demonstrate the use of fundamentals of portfolio and risk management, including return and risk measurement, and portfolio planning and construction.