

## Questions #1-6 of 60

Use the following information to answer Questions 1 through 6.

Charles Connor, CFA, is a portfolio manager at Apple Investments, LLC. Apple is a U.S.-based firm offering a wide spectrum of investment products and services. Connor manages the Biogene Fund, a domestic equity fund specializing in small capitalization growth stocks. The Biogene Fund generally takes significant positions in stocks, commonly owning 4.5–5% of the outstanding shares. The fund's prospectus limits positions to a maximum of 5% of the shares outstanding. The performance of the Biogene Fund has been superior over the last few years, but for the last two quarters the fund has underperformed its benchmark by a wide margin. Connor is determined to improve his performance numbers going forward.

The Biogene prospectus allows Connor to use derivative instruments in his investment strategy. Connor frequently uses options to hedge his fund's exposure as he builds or liquidates positions in his portfolio since Biogene's large positions often take several weeks to acquire. For example, when he identifies a stock to buy, he often buys call options to gain exposure to the stock. As he buys the stock, he sells off the options or allows them to expire. Connor has noticed that the increased volume in the call options often drives the stock price higher for a few days. He has seen a similar negative effect on stock prices when he buys large amounts of put options.

The end of the quarter is just a few days away, and Connor is considering three transactions:

### Transaction A: Buying Put Options on Stock A

The Biogene Fund owns 4.9% of the outstanding stock of Company A, but Connor believes the stock is fully valued and plans to sell the entire position. He anticipates that it will take approximately 45 trading days to liquidate the entire Biogene position in Stock A.

### Transaction B: Buying Call Options on Stock B

The Biogene Fund owns 5% of the outstanding stock of Company B. Connor believes there is significant appreciation potential for Stock B, but the stock price has dropped in recent weeks. Connor is hoping that by taking an option position, there will be a carryover effect on the stock price before quarter end.

### Transaction C: Selling the Biogene Fund's Entire Position in Stock C

Connor believes that Stock C is still attractive, but he is selling the stock with the idea that he will repurchase the position next month. The motivation for the transaction is to capture a capital loss that will reduce the Biogene Fund's tax expense for the year.

Apple has an investment banking department that is active in initial public offerings (IPOs). George Arnold, CFA, is the senior manager of the IPO department. Arnold approached Connor about Stock D, a new IPO being offered by Apple.

Stock D will open trading in two days. Apple had offered the IPO to all of its clients, but approximately 20% of the deal remained unsold. Having read the prospectus, Connor thinks Stock D would be a good fit for his fund, and he expects Stock D to improve his performance in both the short and long term. Connor is not aware of any information related to Stock D beyond that provided in the prospectus. Connor asked to purchase 5% of the IPO, but Arnold limited Biogene's share to 2%, explaining:

"With Biogene's reputation, any participation will make the unsold shares highly marketable. Further, we may need Biogene to acquire more Stock D shares at a later date if the price does not hold up."

Connor is disappointed in being limited to 2% of the offering and suggests to Arnold in an email that, given the 2% limitation, Biogene will not participate in the IPO. Arnold responded a few hours later with the following message:

"I have just spoken with Ms. D, the CFO of Stock D. Although it is too late to alter the prospectus, management believes they will receive a large contract from a foreign government that will boost next year's sales by 20% or more. I urge you to accept the 2%—you won't be sorry!"

After reviewing Arnold's email, Connor agrees to the 2% offer.

## Question #1 of 60

Question ID: 1212784

By executing Transaction A, Connor is:

- A) violating the Standards because his option trading can be reasonably expected to affect the price of Stock A.
- B) violating the Standards because the option position creates a profit opportunity in conflict with Biogene's clients.
- C) not violating the Standards.**

### Explanation

There is no violation of the Standards in Transaction A. Connor is basically hedging any potential loss from a decline in the price of Stock A prior to the completion of his sale transaction. There is no apparent attempt to manipulate the market in this transaction.

### **For Further Reference:**

(Study Session 1, Module 2.3, LOS 2.a, 2.b)

## Question #2 of 60

Question ID: 1212785

By executing Transaction B, Connor is:

- A) violating the Standards because his option trading can be reasonably expected to affect his quarterly performance.**
- B) not violating the Standards because the option position creates a profit opportunity consistent with Biogene's clients' interests.
- C) not violating the Standards because he believes there is significant appreciation potential in Stock B.

Explanation

A critical factor in assessing any violation of Standard II(B) Integrity of Capital Markets – Market Manipulation is the intent of the parties involved. In this case, Connor is hoping that his options transaction drives up the price of Stock B, which would improve the reported performance of the Biogene Fund. This type of manipulation would be a violation of the Standard.

**For Further Reference:**

(Study Session 1, Module 2.3, LOS 2.a, 2.b)

**Question #3 of 60**

Question ID: 1212786

By executing Transaction C, Connor is:

- A) violating the Standards by executing a transaction for tax reasons only.**
- B) violating the Standards by executing a transaction that provides tax benefits to the Biogene Fund.**
- C) not violating the Standards.**

Explanation

Transactions meant to minimize tax liabilities are not prohibited by the Standards. If the Biogene Fund benefits, the investors in the fund will presumably benefit also.

**For Further Reference:**

(Study Session 1, Module 2.2, LOS 2.a, 2.b)

**Question #4 of 60**

Question ID: 1212787

By offering Biogene the opportunity to participate in the IPO of Stock D, Apple Investments has violated CFA Institute Standards relating to:

- A) priority of transactions but not independence and objectivity.**
- B) independence and objectivity but not priority of transactions.**
- C) neither priority of transactions nor independence and objectivity.**

Explanation

Connor was not pressured to take the IPO, and he believed it was a good investment. Connor received no confidential information. The IPO had been made available to all Apple clients prior to Biogene. There is no evidence of a violation of either of these Standards.

**For Further Reference:**

(Study Session 1, Module 2.5, LOS 2.a, 2.b)

**Question #5 of 60**

Question ID: 1212788

Arnold's arguments for limiting Biogene's share to 2% suggest that Apple:

- A)** may engage in a liquidity pumping strategy that would be acceptable given that Biogene is a related entity.
- B) may engage in transaction-based manipulation of Stock D in the future, in violation of Standards relating to market manipulation.**
- C)** is violating Standards related to priority of transactions by offering the IPO to Biogene before it is fully subscribed.

#### Explanation

By suggesting that Biogene might need to acquire more shares to support the price in the future, Arnold is suggesting that Apple would be willing to manipulate the market by creating false trading volume. This is transaction-based manipulation in violation of Standard II(B) Integrity of Capital Markets – Market Manipulation.

#### **For Further Reference:**

(Study Session 1, Module 2.3, LOS 2.a, 2.b)

### **Question #6 of 60**

Question ID: 1212789

Based upon Connor's acceptance of the 2% limitation after receiving the email from Arnold:

- A) Connor has violated Standards relating to material nonpublic information, and Arnold has violated Standards relating to preservation of confidentiality.**
- B)** Connor has not violated Standards relating to material nonpublic information, but Arnold has violated Standards relating to preservation of confidentiality.
- C)** Connor has not violated Standards relating to material nonpublic information, but Arnold has violated Standards relating to preservation of confidentiality and material nonpublic information.

#### Explanation

By changing his previous decision and accepting the 2% based on Arnold's email, Connor has violated the Standards related to material nonpublic information. He has acted based upon the receipt of inside information. Arnold has violated the Standards related to both material nonpublic information and preservation of confidentiality. Arnold violated Standard III(E) – Duties to Clients – Preservation of Confidentiality by revealing information he received based upon a special relationship with Stock D. By passing that information to another area of Apple, Arnold has violated Standard II(A) Integrity of Capital Markets – Material Nonpublic Information as well.

#### **For Further Reference:**

(Study Session 1, Module 2.6, LOS 2.a, 2.b)

### **Questions #7-12 of 60**

Use the following information to answer Questions 7 through 12.

Alfred Farias, fixed income analyst for BNF, Inc., is analyzing the economic prospects of Procken, Krosse, Weira, and Toban, four countries in the same region. He collects the following economic and demographic statistics for the countries:

	Procken	Krosse	Weira	Toban
Current real GDP (in \$ billions)	\$250.00	\$250.00	\$4,500.00	\$4,800.00
Projected real GDP in 5 years (in \$ billions) based on potential GDP growth rate	\$306.00	\$315.00	\$5,262.00	\$5,778.00
Long-term growth rate of capital	4.0%	4.2%	3.2%	3.8%
Current capital base (\$ billions)	\$782.9	\$699.2	\$18,750	\$19,750
Imports (in \$ billions)	\$30.00	\$60.00	\$1,500.00	\$900.00
Exports (in \$ billions)	\$32.00	\$80.00	\$1,000.00	\$900.00
Population (in \$ millions)	20.4	20.0	101.0	100.0
Labor growth rate	1.9%	2.9%	0.4%	0.8%
Cost of capital relative to total factor cost	32.5%	35.0%	25.0%	22.5%
Average real annual appreciation in equities (past five years)	4.0%	4.7%	4.5%	3.8%

A GDP per capita below \$25,000 is considered a developing country, and a GDP per capita greater than \$25,000 is considered a developed country.

Farias concludes that Weira and Toban have reached steady-state growth.

In the latest round of trade negotiations, representatives from each country discussed their efforts to foster their countries' economic development and benefit from the growth of world trade.

Procken's Representative: "We are wary of the potential for loss of domestic industries if we remove trade barriers. Given the state of our economy, I'm not certain that we can lower our trade barriers any further."

Krosse's Representative: "We in Krosse are not investing enough in infrastructure and education to increase the level of productivity and technology in our economy. We also need foreign direct investment and hence we welcome foreign investors."

Weira's Representative: "We are concerned about my country's negative trade balance. Weira needs more exports to sustain our growth."

Toban's Representative: "We seem to be at a point in Toban where the growth rate of my country's labor force may be insufficient to support our GDP growth rate."

## Question #7 of 60

Question ID: 1212791

Which country is *most likely* to benefit from capital deepening?

- A) Weira.
- B) Krosse.
- C) Procken.

Explanation

Krosse is a developing nation with the highest  $\alpha$  (share of capital in GDP) among all the countries. A high value of  $\alpha$  indicates that the next unit of capital added will increase output almost as much as the previous unit of capital. Developing nations with a high  $\alpha$  are more likely to benefit from capital deepening, which should result in an increase in productivity (at least in the short term).

**For Further Reference:**

(Study Session 4, Module 11.1, LOS 11.d)

**Question #8 of 60**

Question ID: 1212792

For this question only, assume that the population growth rate is the same for Krosse and Procken. A possible cause for the difference in growth rate of labor is that relative to Procken, Krosse has:

- A) stricter immigration policies.
- B) a lower labor participation rate.
- C) experienced an increase in average hours worked.**

Explanation

Krosse's labor growth rate is greater than that of Procken's. Labor growth can be accomplished by an increase in the labor force participation rate, an increase in average hours worked, additional supply of labor by immigration, or a higher population growth rate. We are told that the population growth rate is equal for the two countries. The only choice that allows for higher labor growth rate is then higher average hours worked.

**For Further Reference:**

(Study Session 4, Module 11.2, LOS 11.g)

**Question #9 of 60**

Question ID: 1212793

The long-term growth rate of technology (TFP) for Toban is *closest* to:

- A) 0.4%.
- B) 2.1%.
- C) 2.3%.**

Explanation

Growth rate in potential GDP = long-term growth rate of technology +  $\alpha \times$  (long-term growth rate of capital) +  $(1 - \alpha) \times$  (long-term growth rate of labor).

The growth rate in potential GDP using a calculator:  $PV = -\$4,800$ ;  $FV = +\$5,778$ ;  $N = 5$ ; solve for  $I/Y$ .  $I/Y = 3.78\%$ .

Rearrange the equation to solve for long-term growth rate of technology.

$$3.78\% = \text{LTGRT} + (0.225) \times 3.8\% + (0.775) \times 0.8\%$$

$$\text{LTGRT} = 3.78\% - 0.86\% - 0.62\%$$

$$\text{LTGRT} = 2.30\%$$

**For Further Reference:**

(Study Session 4, Module 11.2, LOS 11.e)

**Question #10 of 60**

Question ID: 1212794

Going forward, which country is *most likely* to experience lower stock market appreciation than that experienced over the past five years?

- A) Weira.
- B) Toban.
- C) Procken.

Explanation

If the neoclassical theory holds then the sustainable growth rate of output of  $G^*$  is the same as the long-term growth rate of capital.

The growth rate in potential GDP using a calculator:

Procken (Past = 4.0%):  $PV = -\$250$ ;  $FV = +\$306$ ;  $N = 5$ ; solve for  $I/Y = 4.12\%$ .

Krosse (Past = 4.7%):  $PV = -\$250$ ;  $FV = +\$315$ ;  $N = 5$ ; solve for  $I/Y = 4.73\%$ .

Weira (Past = 4.5%):  $PV = -\$4,500$ ;  $FV = +\$5,262$ ;  $N = 5$ ; solve for  $I/Y = 3.18\%$ .

Toban (Past = 3.8%):  $PV = -\$4,800$ ;  $FV = +\$5,778$ ;  $N = 5$ ; solve for  $I/Y = 3.78\%$ .

Weira's stock market appreciation rate of 4.5% exceeds the potential growth rate of GDP of 3.2% significantly. The difference between potential GDP growth rate and past stock market appreciation for the other three countries differences is relatively smaller.

**For Further Reference:**

(Study Session 4, Module 11.1, LOS 11.b, 11.i)

**Question #11 of 60**

Question ID: 1212795

The rental price of capital in Weira is *closest* to:

- A) 6%.
- B) 12%.
- C) 25%.

Explanation

It is stated in the vignette that Weira has reached steady-state. In steady state (i.e., in equilibrium), the marginal product of capital ( $MPK = \alpha Y/K$ ) and marginal cost of capital (i.e., the *rental price of capital*,  $r$ ) are equal; hence:  $\alpha Y/K = r$ .

$$r = (0.25)(4,500) / (18,750) = 0.06 \text{ or } 6\%$$

**For Further Reference:**

(Study Session 4, Module 11.1, LOS 11.d)

**Question #12 of 60**

Question ID: 1212796

Based on the information provided, which developing country is *most likely* to achieve convergence in growth rates and standard of living with their developed counterparts?

- A) Toban.
- B) Krosse.
- C) Procken.

Explanation

Based on the data in the vignette, Krosse and Procken are developing countries. The GDP per capita for Krosse is \$250 billion divided by 20.0 million people, which is equal to \$12,500. The GDP per capita for Procken is \$250 billion divided by 20.4 million people, which is equal to \$12,255. Krosse is more likely to achieve convergence because Krosse is showing more willingness towards opening up the economy to trade and financial flows than is Procken; Krosse's international trade as a proportion of GDP is higher than Procken's, and comments by Krosse's representative indicate that inflow of foreign capital would be welcome. Finally, comments by Procken's representative indicate an inward-oriented policy, which could hinder convergence.

**For Further Reference:**

(Study Session 4, Module 11.3, LOS 11.j)

**Questions #13-18 of 60**

**Use the following information to answer Questions 13 through 18.**

Lyle Kreiger, CFA, has recently taken an analyst role at Rockway Stone, a small private equity firm based in the United States. As part of his role, he has been asked to review the most recent unaudited financial statements from several private companies that have been identified as potential investments for the firm.

Rockway Stone has a strict policy of only investing in companies that demonstrate a high level of financial reporting quality. The firm has developed an internal scoring system to rank the quality of a target company's financial statements. The scoring system awards points for each incident of low reporting quality; any company that reaches 40 points is not considered for potential investment. The scoring system is shown in Exhibit 1.

**Exhibit 1: Rockway Stone FR Quality Score Sheet**

1. Any instance of a change in policy year-to-year or reclassification of assets, liabilities, revenues, or expenses **5 points**



2. Any instance from 1 that also results in an increase in total assets

**Additional 5  
points**

3. Any instance from 1 that also results in an increase in revenue

**Additional 10  
points**

4. Any indication that earnings are not persistent

**5 points**

The first report Kreiger is reviewing is from Tolston Conductors, a firm providing highly polished metals to the technology industry. Kreiger's supervisor has instructed Kreiger to focus on the inventory note shown in Exhibit 2.

#### **Exhibit 2: Tolston Conductors Extract**

<b>Note 8 – Inventories</b>		
	<b>2014</b>	<b>2013</b>
Raw materials (\$'000)	481	409
WIP (\$'000)	1,392	894
Finished goods (\$'000)	508	496

Finished goods are classified as goods that are complete in all respects except packaging. Of the amount of inventory reported as work-in-progress in 2013, \$342,000 has been reclassified as "other current assets." This WIP consisted primarily of highly polished metals that are now to be further reworked and are not expected to be ready for sale for two years.

Kreiger is also reviewing financial statements from Resonator Wellness, a firm producing health and wellness products in the U.K. Extracts from the pro forma financial statement recently released, along with 2013 and 2012 comparables, is shown in Exhibit 3.

#### **Exhibit 3: Resonator Wellness Financial Statement – (Extract)**

<b>Headline Operating Profit: Quarter Ending 31 December 2014 (£000)</b>			
	<b>2014</b>	<b>2013</b>	<b>2012</b>
Stockholders' equity	8,380	7,980	7,450
Revenue retail outlet sales	1,402.2	3,543.9	3,501.6
Online sales	3,086.2	398.9	389.4
<b>Headline net income</b> (Note A)	1,262.7	1,104.4	1,086.0

**Note A:** Headline net income excludes settlement costs and network costs. Settlement costs are one-off payments to settle legal procedures; these costs totaled (in £000) 20.0, 22.1, and 24.8 in 2012, 2013, and 2014, respectively. Network costs related to running the online business totaled (in £000) 202.0, 325.0, and 885.5 in 2012, 2013, and 2014, respectively. The financial accounts submitted to our bank in accordance with our loan covenants shows net income after charging both settlement and network costs in accordance with local GAAP.

Kreiger notes that the financial statements submitted to the firm's bankers did indeed report net income correctly in accordance with local GAAP. However, this figure was much less prominent than headline net income, as the GAAP

income was disclosed only in the footnotes rather than on the face of the income statement. Kreiger believes that the legal settlements are payments made to dissatisfied customers and are a normal part of business. Kreiger also believes that the increase in network cost is consistent with increased focus on online operations. Resonator's required return on stockholders' equity is 5%.

Krieger's final task is to analyze a set of financial statements for AltoJib Plc., a manufacturing and engineering company that is considering delisting. The company has a large number of investments in associates that Kreiger would like to isolate. Rockway Stone's approach to isolating the impact of investment in associates is to perform some classic DuPont analysis to calculate ROE. In doing so, net margin and asset turnover (but not financial leverage) are adjusted for the impact of investment in associates.

The information Kreiger has to work with is shown in Exhibit 4 along with Rockway Stone's method of isolating the impact of investment in associates on ROE using DuPont analysis.

#### Exhibit 4: AltoJib Plc. Financial Statements (Extracts)

	2014	2013	2012	2011
	(£000)	(£000)	(£000)	(£000)
Revenue	998.5	918.6	817.6	
Net income	44.4	31.2	26.7	
Income from associates	17.8	11.2	8.4	
Total assets	1,260.8	1,166.6	1,043.2	1,012.1
Investment in associates	101.6	83.8	72.6	64.2
Equity	638.4	569.8	542.5	524.2
Financial leverage	2.01	1.99	1.93	

#### Calculation of ROE excluding associates

- Net margin is based on net income excluding income from associates.
- Asset turnover is calculated using average total assets excluding investments in associates.
- Financial leverage is calculated using average assets and average equity including investments in associates.

#### Calculation of total ROE

- Net margin is based on net income including income from associates.
- Asset turnover is calculated using average total assets including investments in associates.
- Financial leverage is calculated using average assets and average equity including investments in associates.

### Question #13 of 60

Question ID: 1212805

Due to the reclassification described in Exhibit 2, inventory turnover will *most likely*:

- A) increase.
- B) remain the same.
- C) decrease.

Explanation

Inventory turnover is cost of sales divided by inventory. A decrease in inventory is likely to cause the ratio to increase as the amount of inventory relative to the cost of goods sold decreases.

**For Further Reference:**

(Study Session 6, Module 18.5, LOS 18.d)

**Question #14 of 60**

Question ID: 1212806

Under the scoring system described in Exhibit 1 and taking into account the inventory note in Exhibit 2, Tolston Conductors should *most accurately* be assigned:

- A) 5 points.
- B) 10 points.
- C) 20 points.

Explanation

Ending inventory and other current assets are both included within total assets, so the reclassification will not alter total assets or revenue.

**For Further Reference:**

(Study Session 6, Module 17.2, LOS 17.d)

**Question #15 of 60**

Question ID: 1212807

Which of the following statements is the *least accurate* regarding Resonator Wellness information shown in Exhibit 3?

- A) The financial statements submitted to analysts are not as decision-useful as they could be due to biased accounting choices.
- B) The financial statements submitted to the bank are not as decision-useful as they could be due to biased accounting choices.
- C) **The financial statements submitted to the bank are decision-useful as they exhibit no evidence of biased accounting choices.**

Explanation

Biased accounting choices are reflected not only in the numbers presented but also in the manner of disclosure of information. The lack of transparency of GAAP-compliant net income relative to the headline net income suggests that the financial statements are not very decision-useful.

**For Further Reference:**

(Study Session 6, Module 17.1, LOS 17.b)

**Question #16 of 60**

Question ID: 1212808

Which of the following conclusions is Kreiger *most likely* to draw about the earnings quality of Resonator Wellness? 2014 net income after correctly including network and settlement costs shows:

- A) compound annual growth of over 7%, and earnings that are of high quality as they are correctly calculated under GAAP.
- B) negative compound annual growth of over 35%, and earnings that are of low quality.**
- C) negative compound annual growth of over 35%, and earnings that are of high quality as they are correctly calculated under GAAP.

#### Explanation

	2014	2013	2012
Headline Net Income	1,262.7	1,104.4	1,086.0
Network costs (from note A)	885.5	325.0	202.0
Settlements (from note A)	24.8	22.1	20.0
<b>Net Income</b>	<b>352.4</b>	<b>757.3</b>	<b>864.0</b>

$$\text{Net Income CAGR } [(352.4 / 864)^{1/2}] - 1 = -0.36 = -36\%$$

$$\text{Average stockholders' equity} = (8,380 + 7,980) / 2 = 8,180$$

$$\text{Return on stockholders' equity for 2014} = 352.4 / 8,180 = 4.31\%$$

Earnings quality refers not only to compliance with GAAP but also to the persistence and level of earnings. The GAAP-compliant net income does not satisfy the minimum return requirement; hence, earnings are low (and therefore of low quality).

#### **For Further Reference:**

(Study Session 6, Module 17.3, LOS 17.h)

### **Question #17 of 60**

Question ID: 1212809

Treating an investment as an investment in associate rather than in a subsidiary is *least likely* to:

- A) overstate net profit margins.
- B) understate fixed assets.
- C) understate net income.**

#### Explanation

An investment in associates is accounted for using the equity method, while investment in a subsidiary is accounted for using the acquisition method. Using either method, net income will be the same. However, fixed assets and total revenue will be lower under the equity method.

#### **For Further Reference:**

**Question #18 of 60**

Question ID: 1212810

Using the Rockway Stone approach to calculating ROE measures outlined in Exhibit 4, Kreiger is *most likely* to conclude that:

- A)** ROE excluding the effects of investment in associates has decreased from 2012 to 2014.
- B)** ROE excluding the effects of investment in associates in 2014 was approximately 35% lower than the total ROE in 2014.
- C)** total ROE was higher than the ROE excluding the effects of investment in associates for 2012 and 2014, but lower in 2013.

Explanation

	2014	2013	2012	2011
	(£000)	(£000)	(£000)	(£000)
Revenue	998.5	918.6	817.6	
Net income	44.4	31.2	26.7	
Income from associates	17.8	11.2	8.4	
NI excluding associates	26.6	20.0	18.3	
Total assets	1,260.8	1,166.6	1,043.2	1,012.1
Investment in assoc.	101.6	83.8	72.6	64.2
Total assets (ex assoc.)	1,159.2	1,082.8	970.6	947.9
Equity	638.4	569.8	542.5	524.2
Average equity	604.1	556.2	533.4	510.2
Average assets	1,213.7	1,104.9	1,027.7	500.8
Average assets (ex assoc.)	1,121.0	1,026.7	959.3	
	2.66%	2.18%	2.24%	
Net margin (ex assoc.)	(26.6 / 998.5)	(20.0 / 918.6)	(18.3 / 817.6)	
Net margin	4.45%	3.40%	3.27%	
	(44.4 / 998.5)	(31.2 / 918.6)	(26.7 / 817.6)	

	0.891	0.895	0.852
Asset TO (ex assoc.)	(998.5 / 1121.0)	(918.6 / 1026.7)	(817.6 / 959.3)
	0.823	0.831	0.796
Asset turnover	(998.5 / 1213.7)	(918.6 / 1104.9)	(817.6 / 1027.7)
	2.01	1.99	1.93
Leverage	(1213.7 / 604.1)	(1104.9 / 556.2)	(1027.7 / 533.4)
	7.35%	5.61%	5.01%
ROE total	44.4 / 604.1)	(31.2 / 556.2)	(26.7 / 533.4)
	4.77%	3.87%	3.68%
ROE			
(ex assoc.)	(0.0266 × 0.891 × 2.01)	(0.0218 × 0.895 × 1.99)	(0.0224 × 0.852 × 1.93)

**For Further Reference:**

(Study Session 6, Module 18.1, LOS 18.a)

**Questions #19-24 of 60****Use the following information to answer Questions 19 through 24.**

In 2009, Continental Supply Company was formed to provide drilling equipment and supplies to contractors and oilfield production companies located throughout the United States. At the end of 2013, Continental Supply created a wholly owned foreign subsidiary, International Oilfield Incorporated, to begin servicing customers located in the North Sea. International Oilfield maintains its financial statements in a currency known as the local currency unit (LCU). Continental Supply follows U.S. GAAP and its presentation currency is the U.S. dollar.

For the years 2013 through 2016, the weighted-average and year-end exchange rates, stated in terms of local currency per U.S. dollar, were as follows:

LCU/\$US	2013	2014	2015	2016
Average	0.90	1.05	1.05	1.25
Year-end	1.00	1.10	1.00	1.50

International Oilfield accounts for its inventory using the lower-of-cost-or- market valuation method in conjunction with the first-in, first-out, cost flow assumption. All of the inventory on hand at the beginning of the year was sold during 2016. Inventory remaining at the end of 2016 was acquired evenly throughout the year.

At the beginning of 2014, International Oilfield purchased equipment totaling LCU 975 million when the exchange rate was LCU 1.00 to \$1. During 2015, equipment with an original cost of LCU 108 million was totally destroyed in a fire. At the end

of 2015, International Oilfield received a LCU 92 million insurance settlement for the loss. On June 30, 2016, International Oilfield purchased equipment totaling LCU 225 million when the exchange rate was LCU 1.25 to \$1.

For the years 2015 and 2016, Continental Supply reported International Oilfield revenues in its consolidated income statement of \$375 million and \$450 million, respectively. There were no inter-company transactions. Following are International Oilfield's balance sheets at the end of 2015 and 2016:

LCU in millions	2016	2015
Cash and receivables	120.0	216.0
Inventory	631.3	650.4
Equipment	820.7	693.6
Liabilities (all monetary)	600.0	600.0
Capital stock	350.0	350.0
Retained earnings	622.0	610.0

At the end of 2016, International Oilfield's retained earnings account was equal to \$525 million and, to date, no dividends have been paid. All of International Oilfield's capital stock was issued at the end of 2013.

### Question #19 of 60

Question ID: 1212798

Assuming International Oilfield is a significantly integrated sales division and virtually all operating, investing, and financing decisions are made by Continental Supply, foreign currency gains and losses that arise from the consolidation of International Oilfield should be reported in:

- A) shareholders' equity.
- B) operating cash flow.
- C) **net income.**

#### Explanation

Assuming International Oilfield is an integrated sales division and Continental Supply makes virtually all of the decisions, the functional currency is likely the presentation currency. Thus, the temporal method is used. Under the temporal method, remeasurement gains and losses are reported in the income statement.

#### **For Further Reference:**

(Study Session 5, Module 15.3, LOS 15.d)

### Question #20 of 60

Question ID: 1212799

Assuming that International Oilfield's equipment is depreciated using the straight-line method over 10 years with no salvage value, calculate the subsidiary's 2016 depreciation expense under the temporal method.

- A) **\$95.7 million.**
- B) \$104.7 million.

C) \$114.7 million.

#### Explanation

International Oilfield is carrying 867 (i.e., 975 – 108) LCU original cost of equipment purchased in 2014 on their books. The 2015 losses due to fire and related insurance settlement do not affect depreciation in 2016 (other than depreciating fewer assets). The new equipment purchased during the year would be depreciated for a half year in 2016. Depreciation will be translated at the historical exchange rate under the temporal method.

Equipment	Calculation	LCU Depreciation	Historical Exchange Rate	USD Depreciation
Originally purchased in 2014	867 / 10	86.7	1	\$86.70
Purchased in 2016 (1/2 year)	1/2 × (225 / 10)	11.25	1.25	<u>\$9.00</u>
Total				<u>\$95.70</u>

#### **For Further Reference:**

(Study Session 5, Module 15.3, LOS 15.d)

### **Question #21 of 60**

Question ID: 1212800

Compute the cumulative translation adjustment reported on Continental Supply's consolidated balance sheet at the end of 2016, assuming International Oilfield is a relatively self-contained and independent operation of Continental Supply.

- A) –\$227 million.
- B) –\$200 million.
- C) \$298 million.

#### Explanation

Under the current rate method, gains and losses that occur as a result of the translation process do not show up on the income statement but are instead accumulated in a balance sheet account called the cumulative translation adjustment account (CTA). The translation gain or loss in each year is calculated and added to the account, acting like a running total of translation gains and losses. The CTA is simply an equity account on the balance sheet.

To compute the CTA for Continental's balance sheet, force the accounting equation ( $A = L + E$ ) to balance with the CTA;  $[(120 \text{ million cash and receivables} + 631.3 \text{ million inventory} + 820.7 \text{ million equipment} - 600 \text{ million liabilities}) / 1.50] - \$350 \text{ million capital stock} - \$525 \text{ retained earnings} = -\$227 \text{ million}$ . The LCU 350 capital stock was issued at the end of 2013 at an exchange rate of LCU 1 = \$1. The \$525 retained earnings figure was given in the text.

#### **For Further Reference:**

(Study Session 5, Module 15.4, LOS 15.d)

### **Question #22 of 60**

Question ID: 1212801

Compared to the temporal method, which of the following *best* describes the impact of the current rate method on International Oilfield's gross profit margin percentage for 2016 when stated in U.S. dollars? The gross profit margin would be:



- A) lower.
- B) higher.**
- C) the same.

#### Explanation

Compared to the temporal method, the current rate method will result in a higher gross profit margin percentage (higher numerator) when the local currency is depreciating as is the case in this scenario (the exchange rate has risen from LCU 1 per \$1 to LCU 1.25 per \$1; thus, it costs more LCUs to buy \$1 which is the result of a depreciating LCU). Under the temporal method, COGS is remeasured at the historic rate; thus, COGS is not impacted by the depreciating currency. Under the current rate method, COGS is translated at the average rate; thus, COGS is lower because of the depreciating currency. Lower COGS results in a higher gross profit margin percentage.

#### **For Further Reference:**

(Study Session 5, Module 15.4, LOS 15.e)

### **Question #23 of 60**

Question ID: 1212802

When remeasuring International Oilfield's 2016 financial statements into the presentation currency, which of the following ratios is not affected by changing exchange rates under the temporal method?

- A) Current ratio.**
- B) Total asset turnover.
- C) Quick ratio.

#### Explanation

Both the numerator (cash + receivables) and denominator (current liabilities) of the quick ratio are remeasured at the current exchange rate under the temporal method. Inventories are ignored in the quick ratio. Since the same rate is used to remeasure both the numerator and denominator, the ratio does not change when stated in the presentation currency.

#### **For Further Reference:**

(Study Session 5, Module 15.3, LOS 15.e)

### **Question #24 of 60**

Question ID: 1212803

Assume the country where International Oilfield is operating has been experiencing 30% annual inflation over the past three years. Which of the following *best* describes the effect on Continental's consolidated financial statements for the year ended 2016?

- A) A gain is recognized in the income statement.**
- B) A loss is recognized in the income statement.
- C) A gain is recognized as a direct adjustment to the balance sheet.

#### Explanation

The temporal method is required if the foreign subsidiary is operating in a highly inflationary environment, defined as cumulative inflation of more than 100% in a 3-year period. Compounded inflation of 30% annually for three years is approximately 120% ( $1.30^3 - 1$ ). Under the temporal method, remeasurement gains and losses are recognized in the income statement. In this case, International Oilfield has a net monetary liability position (monetary liabilities of 600 million > monetary assets of 120 million). Holding net monetary liabilities denominated in a currency that is depreciating will result in a gain.

**For Further Reference:**

(Study Session 5, Module 15.7, LOS 15.g)

## Questions #25-30 of 60

Use the following information to answer Questions 25 through 30.

Sampson Aerospace is a publicly traded U.S. manufacturer. Sampson supplies communication and navigation control systems to manufacturers of airplanes for commercial and government use. The company operates two divisions: (1) Commercial Operations, and (2) Government Operations. Revenues from the Government Operations division comprise 80% of Sampson's total company revenues. Revenues for other companies in the industry are also driven primarily by sales to the U.S. government.

Sampson has gained a reputation for offering unique products and services. Sampson's market share has been increasing, and its net profit margin is among the highest in its industry.

Zone, Inc., ("Zone") is a small privately held network solutions company in the southwestern United States. Zone is profitable, and almost entirely equity financed. Drew Smith, Sampson's CFO, is evaluating a potential acquisition of Zone in a leveraged buyout. In his analysis, Smith makes several adjustments to Zone's financial statements as detailed below:

Adjustment 1: Zone's owner/CEO received a compensation package of \$1.2 million including bonus. This is consistent with CEO compensation packages at other firms. Smith considers the current management team to be very competent and does not anticipate any major changes; however, he increases the estimate for compensation expense to \$1.5 million.

Adjustment 2: Zone has long-term leases on all of its facilities. The lease rates were negotiated before the real estate market collapsed recently. Smith adjusts the leasing cost downward by \$3 million.

Adjustment 3: Zone has purchased fractional ownership in a corporate jet for its CEO. The benefit, with an annual cost of \$350,000, is deemed to be excessive by market standards and Smith adjusts the cost estimate by that amount.

Exhibit 1 shows projections of selected financial data for Zone for the next year.

**Exhibit 1: Selected Financial Information (Estimates) for Zone, Inc.**

Item	\$ Millions
Normalized EBITDA	32
Depreciation	11
SG&A expense	8

Net income	15
Capital expenditure	6
Working capital expense	5
Interest expense	2

*Note: Zone's tax rate is expected to be 25%.*

Sampson Aerospace recently announced that it is reducing its investment return assumption on its pension assets from 6% to 5%, and that it has entered negotiations to possibly acquire controlling equity interests in communications software firms, NavTech and Aerospace Communications. NavTech recently has decided to capitalize a significant portion of its research and development expense, and Aerospace Communications has restructured and reclassified many of its leases from operating to financial leases. Smith recently announced that Sampson had dropped out of negotiations with Knowledge Technologies, claiming it was likely not a sustainable business model.

Consensus forecasts for NavTech and Aerospace Communications are presented in Exhibit 2.

#### Exhibit 2: Selected Financial Data for NavTech and Aerospace Communications

	NavTech	Aerospace Comm.
Expected year-end dividend per share	\$1.07	\$0.55
Expected year-end free cash flow to equity per share	\$0.80	\$1.25
Weighted average cost of capital	10%	9%
Required return on equity	12%	12%
Current stock price	\$21.40	\$25

#### Question #25 of 60

Question ID: 1212819

Regarding Smith's adjustments to Zone's financial statements, the *most appropriate* adjustment is:

- A) Adjustment 1.
- B) Adjustment 2.
- C) Adjustment 3.

#### Explanation

CEO compensation is consistent with market estimates, so no adjustment is necessary. Long-term leases on facilities are legally binding; hence, no adjustment is necessary until the lease comes up for renewal. Elimination of excessive perks is a valid adjustment.

#### For Further Reference:

(Study Session 11, Module 31.2, LOS 31.e)

#### Question #26 of 60

Question ID: 1212820

For valuation purposes, Zone's expected (first year) FCFF is *closest* to:

- A) \$14 million.
- B) \$15 million.
- C) **\$16 million.**

Explanation

Normalized EBITDA	32
(-) Depreciation	11
(=) EBIT	21
Taxes @ 25%	<u>5.25</u>
Operating income after tax	15.75
(+) Depreciation	11
(-) Capex	6
(-) WCInv	<u>5</u>
(=) FCFF	15.75

**For Further Reference:**

(Study Session 11, Module 31.2, LOS 31.e)

**Question #27 of 60**

Question ID: 1212821

The *most appropriate* approach for Sampson Aerospace's valuation of NavTech and Aerospace Communications is:

- A) the dividend discount model.
- B) **the free cash flow model.**
- C) the relative value model.

Explanation

Sampson intends to make a purchase offer for controlling equity interests in the target companies. Cash flow models are more appropriate because a controlling interest allows Sampson to set the target company's financing, investment, and distribution policies.

**For Further Reference:**

(Study Session 9, Module 24.1, LOS 24.h)

**Question #28 of 60**

Question ID: 1212822

Regarding the financial statement information provided in the analyst's report, the quality of financial statements has improved *least* for:

- A) Sampson.
- B) NavTech.**
- C) Aerospace Communications.

#### Explanation

NavTech recently has decided to capitalize much of its research and development expense, thereby deferring much of its R&D expense (rather than immediately recognizing R&D as expense on the income statement). This is an example of aggressive accounting, especially if revenues cannot be matched directly with R&D expense. By reducing the investment return assumption on its pension investments, Sampson is moving to a more conservative approach. By capitalizing its leases (treating as finance leases rather than operating leases), Aerospace Communications more clearly reports its liabilities and assets.

#### **For Further Reference:**

(Study Session 9, Module 24.1, LOS 24.e)

### **Question #29 of 60**

Question ID: 1212823

By claiming that Knowledge Technologies is "not a sustainable business model," Sampson CEO Drew Smith would *most likely* estimate Knowledge Technologies's value using:

- A) balance sheet value.
- B) going concern value.
- C) liquidation value.**

#### Explanation

If the company's business model is not sustainable, the liquidation value is more appropriate than its value as a going concern (which could be negative). Balance sheet value is an accounting concept, not a valuation concept.

#### **For Further Reference:**

(Study Session 9, Module 24.1, LOS 24.b)

### **Question #30 of 60**

Question ID: 1212824

Assuming that NavTech is valued according to the constant growth dividend model, the market expectation of dividend growth implied by NavTech's current stock price is *closest* to:

- A) 3%.
- B) 5%.
- C) 7%.**

#### Explanation

Defining  $P_0$  as the current stock price,  $D_1$  as the expected year-end dividend,  $r$  as the required cost of equity, and  $g$  as the dividend growth rate, the present value formula for constant growth dividends is:

$$P_0 = \$21.40 = \frac{D_1}{r-g} = \frac{\$1.07}{0.12-g}$$

$$0.12 - g = \frac{\$1.07}{\$21.40}$$

$$g = 0.12 - \frac{\$1.07}{\$21.40} = 0.07 = 7\%$$

**For Further Reference:**

(Study Session 9, Module 24.1, LOS 24.d and Study Session 10, Module 27.2, LOS 27.d)

## Questions #31-36 of 60

Use the following information to answer Questions 31 through 36.

Ivan Johnson is reviewing the investment merits of BioTLab, a fast-growing biotechnology company. BioTLab has developed several drugs, which are being licensed to major drug companies. BioTLab also has several drugs in phase III trials (phase III trials are the last testing stage before FDA approval). Johnson notes that two drugs recently received approval which should provide BioTLab solid revenue growth and generate predictable cash flow well into the future. Based on the potential for the two drugs, BioTLab's estimated annual cash flow growth rate for the next two years is 25%, and long-term growth is expected to be 12%. Because of BioTLab's attractive investment opportunities, the company does not pay a dividend. BioTLab's current weighted average cost of capital is 15% and its stock is currently trading at \$50 per share. The following is financial information for BioTLab for the most recent 12 months:

- Net working capital excluding cash increased from \$7,460,000 to \$9,985,000.
- Book value increased from \$81,250,000 to \$101,250,000.
- BioTLab currently has no debt.
- Research facilities and production equipment were purchased for \$8,450,000.
- BioTLab held non-operating assets in the amount of \$875,000.
- Net income for the 12 months was \$20,000,000.
- BioTLab has a marginal tax rate of 40%.
- Noncash charges for depreciation and restructuring for the 12 months were \$1,250,000.

BioTLab's management has indicated an interest in establishing a dividend and will fund new drug research by issuing additional debt.

Johnson also reviews a competitor to BioTLab, Groh Group, which has a larger segment operating in a highly cyclical business. The Groh Group has a debt to equity ratio of 1.0 and pays no dividends. In addition, Groh Group plans to issue bonds in the coming year.

## Question #31 of 60

Question ID: 1212812

Johnson prefers to use free cash flow analysis to value investments. Which of the following statements is *least accurate* in describing the advantages of free cash flow valuation models?

- A) Accounting issues limit the usefulness of reported earnings, while free cash flow is adjusted for these issues.
- B) Determining free cash flow is easier than dividends.**
- C) A company must generate free cash flow to grow in the long run.

#### Explanation

An analyst must review the cash flows from a company's operating, investing, and financing activities to generate a useful free cash flow, while dividends are simply set by the board of directors. Analysts use free cash flow whenever an investor takes a control perspective, such as in the event of an acquisition. The P/E model is considered weak because accounting issues can impact earnings. Companies that do not generate free cash flow in the long run are in financial trouble.

#### **For Further Reference:**

(Study Session 11, Module 28.1, LOS 28.a)

### **Question #32 of 60**

Question ID: 1212813

Using a two-stage, free cash flow to the firm model, determine which of the following is *closest* to the value of BioTLab.

- A) \$419 million.
- B) \$436 million.
- C) \$477 million.**

#### Explanation

Free cash flow to the firm (FCFF) can be calculated in many ways but in this question, you are given enough information to calculate the measure in the following way:

$$\text{FCFF} = \text{net income} + \text{non-cash charges} + \text{interest} (1 - t) - \text{fixed capital investment} - \text{working capital investment}$$

$$\text{FCFF}_0 = 20,000,000 + 1,250,000 + 0 - 8,450,000 - (9,985,000 - 7,460,000) = 10,275,000$$

The next step is to forecast the future FCFFs and the terminal value:

$$\text{FCFF}_1 = 10,275,000(1.25) = 12,843,750$$

$$\text{FCFF}_2 = 12,843,750(1.25) = 16,054,688$$

$$\text{terminal value} = 16,054,688(1.12) / (0.15 - 0.12) = 599,375,000$$

Next, calculate the present value of the FCFFs and the terminal value:

$$\text{PV}_{\text{FCFs}} = \frac{12,843,750}{1.15} + \frac{(16,054,688 + 599,375,000)}{(1.15)^2} = 476,521,739$$

If a firm has non-operating assets (e.g., land held for investment) on its balance sheet, the value of these assets must be added to the value of the operating assets (determined using the present value of the FCFFs and terminal value) to find the total firm value.

total firm value = value of operating assets + value of non-operating assets

total firm value = 476,521,739 + 875,000 = 477,396,739

**For Further Reference:**

(Study Session 11, Module 28.5, LOS 28.j)

**Question #33 of 60**

Question ID: 1212814

If BioTLab establishes a dividend and issues additional debt, the *most likely* effect on FCFF will be:

- A) no effect.
- B) a decrease in FCFF.
- C) an increase in FCFF.

Explanation

If BioTLab established a dividend there would be no impact on either FCFF or FCFE. Changing the company capital structure by increasing debt will not impact FCFF, although it will initially increase FCFE by the amount of debt issued and then reduce FCFE thereafter by the after-tax interest expense.

**For Further Reference:**

(Study Session 11, Module 28.5, LOS 28.g)

**Question #34 of 60**

Question ID: 1212815

Which model would be *most appropriate* in valuing the Groh Group?

- A) FCFF model.
- B) FCFE model.
- C) Dividend Discount model.

Explanation

The FCFF model is better than the FCFE model in valuing debt laden, cyclical companies, and companies with a changing capital structure. Since Groh Group does not pay a dividend, the DDM model would be the least appropriate model to value the company.

**For Further Reference:**

(Study Session 11, Module 28.1, LOS 28.a, 28.g)

**Question #35 of 60**

Question ID: 1212816

Ten years have passed and BioTLab's drug pipeline has generated the expected growth. To support BioTLab's growth, the company levered its balance sheet to a debt-to-equity ratio of 35% by borrowing an additional \$1.6 million during the last year, even as it paid total interest of \$4 million. Still, the company generated \$20 million in free cash flow to equity. The company's tax rate is 40% and pretax interest rate is 6%. The company's required rate of return on equity equals



13%. Using a single-stage FCFF model results in a value of \$483,508,770. The expected growth rate in BioT Lab's free cash flows is *closest* to:

- A) 6%.
- B) 8%.
- C) 10%.

Explanation

$$WACC = (0.35 / 1.35)(0.06)(1 - 0.40) + (1 / 1.35)(0.13) = 10.56\%$$

$$\begin{aligned} FCFF &= FCFE + \text{Int}(1 - T) - \text{net borrowing} \\ &= 20,000,000 + 4,000,000(1 - 0.40) - 1,600,000 \\ &= 20,800,000 \end{aligned}$$

$$\text{firm value} = \frac{FCFF_0(1+g)}{WACC-g}$$

$$483,508,770 = \frac{20,800,000(1+g)}{0.1056-g}$$

$$g = 0.06$$

**For Further Reference:**

(Study Session 11, Module 28.5, LOS 28.j)

**Question #36 of 60**

Question ID: 1212817

Which of the following statements regarding free cash flow models is *least likely* correct?

- A) Sensitivity analysis indicates that the FCFE model's valuation of BioT Lab's common stock is most sensitive to the company's growth rate.
- B) FCFE is net income plus depreciation minus net capital expenditures minus the increase in working capital plus net new debt financing.
- C) FCFF can be inflated by increasing capital expenditures relative to depreciation.

Explanation

FCFF can be inflated by decreasing capital expenditures relative to depreciation. All other statements are true.

**For Further Reference:**

(Study Session 11, Module 28.5, LOS 28.e, 28.g)

**Questions #37-42 of 60**

Use the following information to answer Questions 37 through 42.

Mike Diffle has been asked to evaluate the bonds of Hardin, Inc. The specific issue Diffle is considering has an 8% annual coupon and matures in two years. The bonds are currently callable at 101, and beginning in six months, they are callable at par. Bratton Corporation, Hardin's competitor, also has bonds outstanding which are identical to Hardin's except that they are not callable. Diffle believes the AA rating of both bonds is an accurate reflection of their credit risk. Diffle is wondering if the Bratton bonds might be a better investment than the Hardin bonds. Assume that the following 1-year interest rate tree is used to value bonds with a maturity of up to three years (this tree assumes interest rate volatility of 10%).

Today   Year 1   Year 2

9.324%

8.530%

7.250%

7.634%

6.983%

6.250%

Also, assume that the appropriate spot rates for securities maturing in one, two, and three years are 7.25%, 7.5%, and 7.80%, respectively.

Diffle believes he should begin his analysis with the option-free Bratton bonds. He decides to consider two different approaches to valuing the Bratton Bonds—one that uses the current spot rate curve and another that uses the interest rate tree given above.

For the next step in his analysis, Diffle has decided to calculate the value of the Hardin bonds using the interest rate tree. His assumption is that the bond will be called at any node of the tree where the calculated value exceeds the call price. Diffle summarizes the results of his bond valuation analysis in a memo to his supervisor, Luke Puldo. In this memo, Diffle makes the following statements:

Statement 1:      The value of the option embedded in the Hardin bonds can be derived by simply subtracting the interest rate tree value of the Hardin bonds from the interest rate tree value of the Bratton bonds.

Statement 2:      I am concerned that the 10% volatility assumption used to develop the interest rate tree might be too low. A higher volatility assumption would result in a lower value for the Hardin bonds.

After reviewing Diffle's analysis, Puldo notes that Diffle has not included any information on the option adjusted spread (OAS) for the Hardin bonds. Puldo suggests that Diffle should evaluate the OAS in order to get an idea of the liquidity risk of the Hardin bonds. Diffle counters that the OAS may not be very informative in this case, since he is uncertain as to the reliability of the interest rate volatility assumption.

To finish the analysis, Diffle would like to use his binomial model to evaluate the interest rate risk of both the Hardin bonds and the Bratton bonds. Diffle starts out with the benchmark interest rate tree and estimated OAS for both bonds. Then he shocks interest rates up and down by 25 basis points throughout the tree and adds the OAS estimated earlier. Using the tree and standard backward induction process, Diffle calculates values for the bonds. He plans to use these values as inputs into the following formulas for duration and convexity:

$$\text{duration} = \frac{V_- - V_+}{2 \times V_0 \times \Delta y} \qquad \text{convexity} = \frac{V_+ + V_- - 2V_0}{V_0 \times (\Delta y)^2}$$

Puldo notes that the duration estimate for the two bonds is not directly comparable. Assuming that the underlying option is at- or near-the-money, the duration of one of the bonds will be lower than the other one.

### Question #37 of 60

Question ID: 1212826

Calculate the value of the Bratton bonds using the interest rate tree.

- A) 100.218.
- B) 100.378.
- C) **100.915.**

#### Explanation

*Interest rate tree:* Discount maturity value back one year at different 1-year forward rates, then take the equally weighted average of those values discounted back to today at today's 1-year rate:

$$V = 0.5 \times [(108 / 1.08530) + 8] / 1.0725 + 0.5 \times [(108 / 1.06983) + 8] / 1.0725$$

$$V = 0.5 \times (99.512 + 8) / 1.0725 + 0.5 \times (100.951 + 8) / 1.0725$$

$$V = 50.122 + 50.793 = 100.915$$

<u>Today</u>	<u>Year 1</u>	<u>Year 2</u>
		108
	107.512	
100.915		108
	108.951	
		108

#### **For Further Reference:**

(Study Session 12, Module 33.1, LOS 33.d)

### Question #38 of 60

Question ID: 1212827

Using the interest rate tree, and assuming that the bonds will be called at any node of the tree where the calculated value exceeds the call price, which of the following is *closest* to the value of the Hardin bonds?

- A) **100.472.**
- B) 100.915.
- C) 101.358.

#### Explanation

Use the same method as in the previous problem, but remember that if the value at one node exceeds the call price, then the call price should be used for that node. In this case, the value at the lower node would be  $108 / 1.06983 = 100.951$ .

The assumption is that the bond would be called at the call price one year from now, or 100.

$$V = 0.5 \times (99.512 + 8) / 1.0725 + 0.5 \times (100 + 8) / 1.0725$$

$$V = 50.122 + 50.350 = 100.472$$

**For Further Reference:**

(Study Session 13, Module 34.2, LOS 34.f)

**Question #39 of 60**

Question ID: 1212828

Indicate whether the statements made by Diffle in his memo regarding the value of the embedded option and the effect of the volatility assumption are correct.

- A) Only the statement regarding the value of the embedded option is correct.**
- B) Only the statement regarding the effect of the volatility assumption is correct.**
- C) Both statements are correct.**

Explanation

Statement 1 is correct. The value of the option would be the difference between the value calculated with no call feature (the Bratton bonds) and the value calculated assuming the bond is callable (the Hardin bonds). Recall that the vignette stated the Bratton and Hardin bonds were identical except for the call feature in the Hardin bonds. The option value would therefore be:  $100.915 - 100.472 = 0.443$ . Statement 2 is also correct. Increased volatility would increase the value of the option, thus lowering the value of the callable bond.

**For Further Reference:**

(Study Session 13, Module 34.1, LOS 34.b, 34.h)

**Question #40 of 60**

Question ID: 1212829

Which of the following *most accurately* critiques the OAS discussion between Diffle and Puldo? Puldo is:

- A) correct that the OAS will provide insight into the liquidity risk of the Hardin bonds, and Diffle is correct that different volatility assumptions would change the OAS.**
- B) correct that the OAS will provide insight into the liquidity risk of the Hardin Bonds, but Diffle is incorrect since OAS implicitly adjusts for the volatility of interest rates.**
- C) incorrect that the OAS will provide insight into the liquidity risk of the Hardin Bonds, but Diffle is correct that different volatility assumptions would change the OAS.**

Explanation

The OAS accounts for compensation for credit and liquidity risk after the optionality has been removed (i.e., after cash flows have been adjusted). Since in this case the credit risk of the bonds is similar, the OAS could prove helpful in evaluating the relative liquidity risk. OAS will be affected by different assumptions regarding the volatility of interest rates.

**For Further Reference:**

(Study Session 13, Module 34.4, LOS 34.g)

### Question #41 of 60

Question ID: 1212830

With regards to Puldo's statement about comparability of duration of the two bonds, which of the following statements is *most accurate*? Bratton bonds' duration would be:

- A) lower than the duration of Hardin bonds under a rising interest rate scenario.
- B) lower than the duration of Hardin bonds under a declining interest rate scenario.
- C) **higher than the duration of Hardin bonds under a declining interest rate scenario.**

#### Explanation

Option-free Bratton bonds will have higher one-sided down duration compared to the callable Hardin bonds when the underlying option is at- or near-the-money. Due to the underlying call option, the appreciation of Hardin bonds in a declining interest rate scenario will be limited.

#### **For Further Reference:**

(Study Session 13, Module 34.6, LOS 34.k)

### Question #42 of 60

Question ID: 1212831

Which of the following statements is *most accurate* regarding Diffle's calculation of duration and convexity?

- A) The duration estimate will be inaccurate since it does not account for any change in cash flows due to the call option embedded in the Hardin bond.
- B) **The duration estimate for the Bratton bonds will reflect the projected percentage change in price for a 100-basis-point change in interest rates.**
- C) The estimates for both duration and convexity will be inaccurate because the OAS was not estimated again after the rate shock.

#### Explanation

The duration formula given will calculate the percentage change in price for a 100-basis-point change in yield, regardless of the actual change in rates used to derive  $BV_-$  and  $BV_+$ . The standard backward induction process would ensure that the derived values of  $BV_-$  and  $BV_+$  reflect any potential change in cash flows due to embedded options.

#### **For Further Reference:**

(Study Session 13, Module 34.5, LOS 34.i)

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### Questions #43-48 of 60

Use the following information to answer Questions 43 through 48.

Charles Mabry manages a portfolio of equity investments heavily concentrated in the biotech industry. He just returned from an annual meeting among leading biotech analysts in San Francisco. Mabry and other industry experts agree that the latest industry volatility is a result of questionable product safety testing methodologies. While no firms in the industry have escaped the public attention brought on by the questionable safety testing, one company in particular is expected to receive further attention—Biological Instruments Corporation (BIC), one of several long biotech positions in Mabry's portfolio. BIC is not expected to pay dividends in the foreseeable future. Several regulatory agencies as well as public interest groups have heavily criticized the rigor of BIC's product safety testing.

In an effort to manage the risk associated with BIC, Mabry has decided to allocate a portion of his portfolio to options on BIC's common stock. After surveying the derivatives market, Mabry has identified the following European options on BIC common stock:

BIC Call Options				BIC Put Options			
	Strike	Maturity	Premium		Strike	Maturity	Premium
Call A	40	October	3.51	Put D	30	November	2.31
Call B	50	October	1.98	Put E	40	November	4.14
Call C	60	October	1.42	Put F	50	November	9.21

*Note: October options expire on the 21st of the month, while November options expire on the 18th.*

Mabry wants to hedge the large BIC equity position in his portfolio, which closed yesterday (June 1) at \$42 per share. Since Mabry is relatively inexperienced with utilizing derivatives in his portfolios, Mabry enlists the help of an analyst from another firm, James Grimell.

Mabry and Grimell arrange a meeting in Boston where Mabry discusses his expectations regarding the future returns of BIC's equity. Mabry expects BIC equity to make a recovery from the intense market scrutiny but wants to provide his portfolio with a hedge in case BIC has a negative surprise. Grimell makes the following suggestion:

"If you want to avoid selling the BIC position and are willing to earn only the risk-free rate of return, you should sell calls and buy puts on BIC stock with the same market premium. Alternatively, you could buy put options to manage the risk of your portfolio. I recommend waiting until the vega on the options rises, making them less attractive and cheaper to purchase."

### Question #43 of 60

Question ID: 1212833

Which of the following statements regarding the delta of the BIC options is correct? (Assume that the largest delta is defined as the delta furthest from zero.)

- A) Call C has the largest delta of all the BIC options.
- B) Put D has the smallest delta of all the BIC options.
- C) Put F has the largest delta of all the BIC options.

Explanation

An option that is deep in-the-money will have the largest delta. Call options that are deep in-the-money will have a delta close to one, while put options that are deep in-the-money will have a delta close to  $-1$ . Options that are out-of-the-money will have deltas close to zero. Put F is the option that is deepest in-the-money, and therefore has the largest delta (even though it is negative, the change in the price of Put F given a change in the price of BIC stock will be larger than any of the other options). Call C is the deepest out-of-the-money option, and thus has the smallest delta.

**For Further Reference:**

(Study Session 14, Module 38.7, LOS 38.k)

**Question #44 of 60**

Question ID: 1212834

If the gamma of Put E is equal to 0.081, which of the following correctly interprets the option's gamma?

- A) The sensitivity of Put E's price to changes in BIC's stock price is very likely to change.**
- B)** A dynamic hedging strategy using Put E would require infrequent rebalancing.
- C)** A \$1.00 increase in BIC's stock price will increase Put E's premium by \$0.081.

Explanation

An option's gamma measures the change in the delta for a change in the price of the underlying asset. The gamma of an option is highest when an option is at-the-money since the probability of moving in or out of the money is high. Put E is close to being at-the-money and because it has a gamma of greater than zero, the sensitivity of Put E's price to changes in BIC's stock price (i.e., the delta) is likely to change. The higher the gamma, the greater the change in delta given a change in stock price.

**For Further Reference:**

(Study Session 14, Module 38.7, LOS 38.l)

**Question #45 of 60**

Question ID: 1212835

Assuming that on October 15, the closing price of BIC common stock is \$40 per share, how would the delta of Put F have changed from June 1?

- A) The delta on Put F will move closer to  $-1$ .**
- B)** The delta on Put F will move closer to 0.
- C)** The delta on Put F will move closer to 1.

Explanation

As the option moves further into the money and as the expiration date approaches, the delta of a put option moves closer to  $-1$ .

**For Further Reference:**

(Study Session 14, Module 38.7, LOS 38.k)

**Question #46 of 60**

If the premium on Put D on November 1 is \$3.18, which of the following has *most likely* occurred?

- A) The price of BIC stock has decreased to \$26.82.
- B) BIC had a negative earnings surprise.**
- C) Volatility of BIC stock has decreased.

Explanation

The premium on Put D has risen from \$2.31 to \$3.18 and there is still time left until expiration. Therefore, the increase in value must have come from either a decrease in stock price, an increase in volatility, or both of these events. Choice A would be correct if the option was at expiration and the \$3.18 represented only intrinsic value. Since we are not yet at the expiration date, the stock price must be above \$26.82. A negative earnings surprise would most likely cause a drop in the market price of the stock. Since there is no indication of the exact amount of the drop in price, the premium observed is a possibility. A decrease in BIC volatility would reduce the put premium, not increase it.

**For Further Reference:**

(Study Session 14, Module 38.7, LOS 38.k)

**Question #47 of 60**

Given Mabry's assessment of the risks associated with BIC, which option strategy would be the *most* effective in delta-neutral hedging the risk of BIC stock?

- A) Add put options to the portfolio as the put option delta moves closer to zero.**
- B) Add call options to the portfolio as the call option delta moves further away from zero.
- C) Add put options to the portfolio as the put option delta moves toward  $-1$ .

Explanation

To protect a portfolio against an expected decrease in the value of a long equity position, put options can be purchased (i.e., a protective put strategy). The number of puts to purchase depends on the hedge ratio, which depends on the option's delta. As a put option's delta moves closer to zero, the put becomes a less-effective hedging instrument, so we need to use more of them. Thus, we must add additional put options to the portfolio as the put option delta moves closer to zero.

**For Further Reference:**

(Study Session 14, Module 38.7, LOS 38.l)

**Question #48 of 60**

Which of the following correctly analyzes Grimell's comments regarding earning the risk-free rate by selling calls and buying puts, and regarding waiting for the option vegas to increase?

- A) Only Grimell's statement regarding earning the risk-free rate is correct.**



**B)** Only Grimell's statement regarding waiting for vega to rise is correct.

**C) Neither of Grimell's statements is correct.**

### Explanation

Grimell is incorrect in both of his statements. Using put-call parity, Mabry could create a position in which he would earn the risk-free rate of return but he would need to sell calls and buy puts with the same strike price, not the same premium. As the vega (volatility relative to price) of an option increases, it would become more sensitive to changes in the volatility of the underlying asset. Therefore, the price would likely rise, not fall.

### **For Further Reference:**

(Study Session 14, Module 38.7, LOS 38.k)

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## **Questions #49-54 of 60**

**Use the following information to answer Questions 49 through 54.**

Gordon Stenton, CFA, works for a small investment management firm in the United States. Part of his role involves managing portfolios for high net worth individuals. Currently, Stenton is corresponding with Rachael Matten. Matten has withdrawn her assets from Altune, an asset management firm, and is considering allocating \$2.5 million of those funds to Stenton's firm. Matten indicated that she was unhappy with the level of disclosure about trading methods and risk management that were employed at Altune.

Matten has sent Stenton a list of questions to assess the policies at Stenton's firm.

The first issue Matten wants clarification on pertains to the use of VaR. Among the documents that Altune sent Matten were two statements (shown in Exhibit 1). Matten was unsure of how to interpret either of these statements.

### **Exhibit 1: VaR**

Statement 1: Your portfolio has a 5% monthly VaR of \$225,000.

VaR is calculated using a parametric methodology and an assumption of normality for all risk factors.

Statement 2: The average loss once the VaR cutoff is exceeded is estimated to be \$320,000.

Matten indicates that in Statement 1, she understands that the \$225,000 represents the minimum loss that will occur 5% of the time. She would also like to confirm her suspicion that the 1% VaR (loss) would be lower.

To provide Matten the risk management process employed at his firm, Stenton intends to send Matten the description shown in Exhibit 2.

### **Exhibit 2: Risk Management Measures**

#### **Primary Risk Management Measure – Steps**

**Step 1:** Identify the top 10 exposures for the portfolio.

**Step 2:** Design a hypothetical global event that would simultaneously adversely affect each of the

exposures.

**Step 3:** Assess the impact on the portfolio.

Matten has also raised an issue about investing in ETFs and the trading methods used by Stenton. She has read several negative comments in the financial press regarding the use of algorithms to trade and about the growing trend of high frequency trading. She has asked Stenton to comment on the concerns she has noted in Exhibit 3.

### Exhibit 3: Concerns

Concern 1: The tracking error of ETFs chosen by Stenton tends to be fairly high.

Concern 2: The increase in market fragmentation resulting from an increase in electronic markets.

## Question #49 of 60

Question ID: 1212847

Which of the following statements regarding Statement 1 in Exhibit 1 is *least accurate*?

- A) The monthly VaR of \$225,000 indicates an annual VaR of \$2.7 million.**
- B) The fund will lose more than \$225,000 in a month, 5% of the time.**
- C) The methodology described is not applicable to portfolios containing option positions.**

### Explanation

A monthly VaR cannot be annualized by simply multiplying by 12. The monthly return and standard deviation would need to be annualized and VaR recalculated. An assumption of a normal distribution is invalid if options were in the portfolio.

### For Further Reference:

(Study Session 16, Module 45.1, LOS 45.b)

## Question #50 of 60

Question ID: 1212848

Statement 2 in Exhibit 1 is *most accurately* described as:

- A) incremental VaR.**
- B) conditional VaR.**
- C) marginal VaR.**

### Explanation

The estimated loss under the condition that VaR has been exceeded is known as conditional VaR.

### For Further Reference:

(Study Session 16, Module 45.2, LOS 45.e)

## Question #51 of 60

Question ID: 1212849

In her interpretation of VaR, Matten is *most likely*:

- A) correct regarding the \$225,000 but incorrect regarding the 1% VaR.**
- B) incorrect regarding the \$225,000 but correct regarding the 1% VaR.
- C) incorrect regarding the \$225,000 and the 1% VaR.

#### Explanation

The \$225,000 is a minimum loss that will be exceeded 5% of the time. A 1% VaR corresponds to a greater loss than a 5% VaR.

#### **For Further Reference:**

(Study Session 16, Module 45.1, LOS 45.a)

### **Question #52 of 60**

Question ID: 1212850

The primary risk management measure discussed in Exhibit 2 is *most accurately* described as:

- A) sensitivity risk analysis.
- B) reverse stress testing.**
- C) Monte Carlo simulation.

#### Explanation

The description is of reverse stress testing, which is a form of scenario analysis, not sensitivity analysis. A Monte Carlo simulation would run many repeated scenarios.

#### **For Further Reference:**

(Study Session 16, Module 45.3, LOS 45.h)

### **Question #53 of 60**

Question ID: 1212851

Stenton would *least accurately* respond to Concern 1 in Exhibit 3 by saying that tracking errors are caused by:

- A) service charges paid by the authorized parties for primary market transactions.**
- B) the increased use of execution algorithms to profit from arbitrage opportunities, which has decreased market stability.
- C) sampling and optimization methods used by funds.

#### Explanation

Fund fees/expenses, sampling and optimization, fund accounting practices, use of depository receipts, index changes, regulatory and tax requirements, and asset manager operations contribute to ETF tracking errors. Service fees paid by APs offset any incidentals that the ETF bears in the creation/redemption process and do not contribute to tracking error.

#### **For Further Reference:**

(Study Session 16, Module 43.1, LOS 43.c)

**Question #54 of 60**

Question ID: 1212852

Stenton should *most accurately* respond to Concern 2 in Exhibit 3 by saying that:

- A) U.S. markets are not fragmented.
- B) one specific type of trading algorithm, smart order routing, is chiefly responsible for market fragmentation.
- C) smart order routing was developed as a response to market fragmentation.

Explanation

Market fragmentation occurs when the number of venues trading the same instrument increases. As a response, algorithms are used to aggregate liquidity and route orders to the venues that have the best price and market depth.

**For Further Reference:**

(Study Session 17, Module 48.2, LOS 48.e)

**Questions #55-60 of 60**

Use the following information to answer Questions 55 through 60.

Samuel Edson, CFA, portfolio manager for Driver Associates, employs a multifactor model to evaluate individual stocks and portfolios. Edson examines several possible risk factors and finds two that are priced in the marketplace. These two factors are investor sentiment (IS) risk and business cycle (BC) risk. Edson manages three equity portfolios (A, B, and C) and derives the following relationships for each portfolio, as well as for the S&P 500 stock market index:

$$R_A = 0.1750 + 2.0F_{IS} + 1.5F_{BC} \quad (1)$$

$$R_B = 0.0940 + 0.5F_{IS} + 0.8F_{BC} \quad (2)$$

$$R_C = 0.1550 + 1.25F_{IS} + 1.15F_{BC} \quad (3)$$

$$R_{S\&P} = 0.1475 + 1.5F_{IS} + 1.25F_{BC} \quad (4)$$

where:

$R_A$ ,  $R_B$ ,  $R_C$ , and  $R_{S\&P}$  = the returns for portfolios A, B, C, and the S&P 500 market index, respectively

Portfolios A and B are well-diversified, while C is a less than fully diversified, value-oriented portfolio.  $F_{IS}$  is the surprise in investor sentiment, and  $F_{BC}$  is the surprise in the business cycle. Surprises in the risk factors are defined as the difference between the actual value and the predicted value.

Exhibit 1 provides data for the actual and predicted values for the investor sentiment and business cycle risk factors.

**Exhibit 1: Risk Factor Values**

Factor	Actual Value	Predicted Value
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Investor sentiment	1%	2%
Business cycle	2%	3%

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Driver Associates also provides Edson with the following multifactor equations on three additional portfolios (D, E, and Z):

$$E(R_D) = R_F + 1.0F_{IS} + 0.0F_{BC} = 9\% \quad (5)$$

$$E(R_E) = R_F + 0.0F_{IS} + 1.0F_{BC} = 8\% \quad (6)$$

$$E(R_Z) = R_F + 1.5F_{IS} + 1.25F_{BC} = 14.75\% \quad (7)$$

Driver Associates uses a two-factor arbitrage pricing model to develop equilibrium expected returns for individual stocks and portfolios:

$$E(R) = \text{risk-free rate} + b_1\lambda_1 + b_2\lambda_2 \quad (8)$$

where:

$b_1$  = sensitivity of the portfolio return to changes in risk factor 1

$b_2$  = sensitivity of the portfolio return to changes in risk factor 2

$\lambda_1$  = risk premium associated with risk factor 1

$\lambda_2$  = risk premium associated with risk factor 2

At the time of Edson's analysis, the long-term government bond yield was 5%.

## Question #55 of 60

Question ID: 1212840

Equations (1) through (4) are examples of:

- A) macroeconomic factor models.**
- B) fundamental factor models.
- C) statistical factor models.

### Explanation

The models in equations 1 through 4 employ factors derived from macroeconomic variables.

### **For Further Reference:**

(Study Session 16, Module 44.2, LOS 44.d)

## Question #56 of 60

Question ID: 1212841

Edson's supervisor, Rosemary Valry, asks Edson to interpret the intercept of the multifactor equation for Portfolio A (0.175). Edson should respond that the intercept equals:

- A) the expected return for Portfolio A, assuming no surprises in the macroeconomic variables.**

- B)** the expected return for Portfolio A, assuming the macroeconomic variables (investor sentiment and business cycle) equal zero.
- C)** the expected abnormal return for Portfolio A.

#### Explanation

The intercept in a macroeconomic factor model equals the expected return for the portfolio examined in the model (assuming no surprises in the macroeconomic variables). The factors in the multifactor equations,  $F_{IS}$  and  $F_{BC}$ , are factor "surprises," which by definition are expected to equal zero (i.e., by definition, zero "surprise" is "expected"). So, by assumption,  $F_{IS}$  and  $F_{BC}$  are expected to equal zero. Therefore, the expected return for Portfolio A equals its intercept (17.5%).

#### **For Further Reference:**

(Study Session 16, Module 44.2, LOS 44.d)

### **Question #57 of 60**

Question ID: 1212842

The firm-specific surprises contributed 1.20% to Portfolio A's return. Using the data in Exhibit 1, the actual return on Portfolio A is *closest* to:

- A)** 12.2%.
- B)** 13.7%.
- C)** 15.2%.

#### Explanation

The multifactor equation for Portfolio A is used to answer this question. Simply insert the factor surprises for  $F_{IS}$  and  $F_{BC}$ . From Exhibit 1,  $F_{IS} = 0.01 - 0.02 = -0.01$  and  $F_{BC} = 0.02 - 0.03 = -0.01$ . Therefore, both factor surprises equal  $-1\%$ . Substituting into the multifactor equation for Portfolio A and including the firm-specific surprise return:  $0.1750 + 2(-0.01) + 1.5(-0.01) + 0.012 = 15.2\%$ .

#### **For Further Reference:**

(Study Session 16, Module 44.2, LOS 44.d)

### **Question #58 of 60**

Question ID: 1212843

Driver Associates uses portfolios D, E, and Z as part of their risk management strategies. Which of these portfolios are factor portfolios?

- A)** Portfolios D and E.
- B)** Portfolios D and Z.
- C)** Portfolio Z only.

#### Explanation

A portfolio that has a sensitivity of 1.0 to one of the macroeconomic factors, and zero sensitivity to the remaining macroeconomic factors is called a factor portfolio. Portfolios D and E are factor portfolios. A portfolio that has factor

sensitivities that equal the sensitivities of the benchmark is called a tracking portfolio. Portfolio Z has factor sensitivities that exactly match those of the S&P 500.

**For Further Reference:**

(Study Session 16, Module 44.3, LOS 44.f)

**Question #59 of 60**

Question ID: 1212844

Valry instructs Edson to use the two-factor model to examine Driver Associates's well-diversified balanced Portfolio P, which has an Investor Sentiment factor sensitivity equal to 1.25 and a Business Cycle factor sensitivity equal to 1.10. According to Driver Associates's model, the expected return for Portfolio P equals:

- A) 8.3%.
- B) 10.8%.
- C) 13.3%.

Explanation

According to the Arbitrage Pricing Model, the expected return equals risk-free rate +  $b_1RP_1 + b_2RP_2$ , where  $RP_i$  is the risk premium for factor  $i$ . Portfolio D is designed to have sensitivity equal to one to the investor sentiment risk factor and sensitivity equal to zero to the business cycle risk factor. Similarly, Portfolio E is a portfolio designed to have sensitivity equal to zero to the investor sentiment risk factor and sensitivity equal to one to the business cycle risk factor. Portfolios that have a sensitivity equal to 1.0 to one factor and zero sensitivity to the remaining factors are called *factor portfolios*. Therefore, Portfolio D is the investor sentiment factor portfolio, and Portfolio E is the business cycle factor portfolio. According to the multifactor equations, the expected return for the investor sentiment factor portfolio (D) equals 9% and for the business cycle factor portfolio (E) equals 8%. Risk premiums are defined as the difference between the expected return on the appropriate factor portfolio and the risk-free rate. The risk-free rate is 5% (the long-term government bond yield). Therefore, the investor sentiment risk premium equals  $0.09 - 0.05 = 0.04$ . Similarly, the business cycle risk premium equals  $0.08 - 0.05 = 0.03$ . Therefore, the expected return for Portfolio P equals  $0.05 + 1.25(0.04) + 1.1(0.03) = 13.3\%$ .

**For Further Reference:**

(Study Session 16, Module 44.2, LOS 44.d)

**Question #60 of 60**

Question ID: 1212845

Assuming Driver Associates uses the S&P 500 Index as their performance benchmark, which of the following portfolios is expected to have the *least* active factor risk?

- A) Portfolio D.
- B) Portfolio E.
- C) Portfolio Z.

Explanation

Active factor risk is caused by deviations of a portfolio's factor sensitivities from the benchmark factor sensitivities. Deviations are quite large for both Portfolios D and E, but Portfolio Z's factor sensitivities match those of the S&P 500 benchmark (1.5 and 1.25).

**For Further Reference:**

(Study Session 16, Module 44.3, LOS 44.f)