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CFA Level II Mock Exam 4
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Revision 1

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Questions 1 through 6 relate to Ethical and Professional Standards

Walnut Brothers Case Scenario

Walnut Brothers (WAB) is an equity management firm in Alabama, USA. WAB has been famous for the quality of the services it offers, and has hence received a very high ranking amongst competitors. Tom Hamilton, an independent financial consultant, was intrigued by WAB's success and desired to learn the key to its success. Accordingly, Hamilton contacted Laura Snow, WAB's chief investment officer, for a tour of the firm and an insight into its practices. During his initial conversation with Snow, Hamilton determined that some of the research reports produced by WAB were compensated indirectly as stock warrants of the subject companies offered to the analysts who wrote the report. In addition, WAB's employees often accepted paid travel arrangements, including chartered flights, from the companies they covered. However, these arrangements were accepted only when commercial transportation to the specific areas was unavailable.

While touring, Hamilton met Jackie Lee, a portfolio manager at WAB. Lee followed the five largest firms in the telecommunications sector of the U.S. market. At the time of Hamilton's visit, Lee was evaluating the investment prospects of AXO Tech Ltd, a telecom firm, to prepare a research report for distribution to WAB's clients. Upon request, Lee allowed Hamilton to review the report, since it only contained factual information and no recommendation as yet. When Hamilton reviewed the report, he determined that Lee had cited specific quotations of some analysts and had referenced them as 'by a leading analyst' and 'by an investment expert'. In addition, for comparison purposes, Lee had included the statistical estimates of other analysts in an exhibit form, mentioning just the numbers. He properly cited those analysts in his report.

Apart from the above report, Lee was also reviewing the financial statements of Total Enterprises (TEN). In his efforts to determine a valuation estimate for the firm, Lee used a statistical model that related a stock's price to a number of fundamental factors. The model was developed by Jonathan Gray, a research analyst that worked with WAB around three years ago. Gray had expended considerable hours in designing the model, and had used his expertise to make it statistically correct. Lee used the model in his report, but did not cite Gray's name since he no longer worked for the firm. In addition, he also used considerable portions of unedited information from a research report prepared by another analyst at the firm. He released the report under his name.

After meeting Lee, Hamilton came across Anthony Ford, one of WAB's leading financial analyst. With his skill and expertise, Ford had contributed a great deal to WAB's success and had also managed to gain considerable respect in the global financial circle. Many investors and institutional clients followed his research, and the investing public kept on a watchful eye on his new releases. Consequently, the information provided by him had a significant effect on the market, and on the prices of the concerned securities. While talking to Ford, Hamilton discovered that he had recently altered his recommendation on the stock of HT Enterprises. He, however, only distributed his changed recommendation to his personal clients and no one else.

Hamilton visited the in-house trading department of WAB to evaluate their trading policies and procedures. When he asked Snow about them, she answered with the following comment:

"When WAB is in possession of material nonpublic information, it ensures the following policies are strictly followed:

1. A prohibition on all types of risk-arbitrage trading.

2. Market-making activities are allowed, however, market makers are allowed only to take the contra side of unsolicited customer trades."

Continuing with his tour of the department, Hamilton met Pebble Toss, an investment advisor at WAB. Toss had entered into an agreement with one of her brokers, Vault Company, whereby Vault would send new client accounts to her in exchange for trading those accounts exclusively through Vault. In her own time, Toss had carefully studied the execution polices and prices of a number of Vault's competitors, and had arrived to the conclusion that Vault offered the best price and execution. So, in addition to the clients that explicitly stated that their trades be handled through Vault, Toss also directed transactions of other clients to Vault as a reward for directing clients to Toss. She disclosed this arrangement to the clients. Hamilton was not sure of this policy. He carefully studied one of Vault's competitors, the Pinnacle Exchange (PINE). PINE was planning to launch a new futures contract, and in order to convince hedgers and arbitrageurs to use the contract, PINE entered into an agreement with the members to commit to a certain level of trading volume in exchange for reduced commissions. PINE believed that this practice would demonstrate that the exchange has the best liquidity and, in turn, help large institutions and individual investors.

1. With regard to WAB's compensation policy and travel funding, is the firm *most likely* in compliance with the CFA Institute Standards of Professional Conduct?

    A. Yes.
    B. Only with respect to compensation.
    C. Only with respect to travel funding.

2. With regard to the report on AXO Tech Ltd, has Lee *most likely* violated the CFA Institute Standards of Professional Conduct?

    A. Yes.
    B. Only with respect to the specific quotations.
    C. Only with respect to the statistical estimates.

3. With regard to his report on Total Enterprises, has Lee *most likely* violated the CFA Institute Standards of Professional Conduct?

    A. Yes.
    B. Only with respect to the statistical models used.
    C. Only with respect to the portions of research report used.

4. With regard to his changed recommendation, has Ford *most likely* violated Standard II-A, Material Nonpublic Information, of the CFA Institute Standards of Professional Conduct?

    A. No.
    B. No, only if Ford makes the information public before it is distributed to his clients.
    C. No, only if Ford disseminates the information to his clients and the public at the same time.

5. Are WAB's trading policies *most likely* in compliance with Standard II-A, Material Nonpublic Information, of the CFA Institute Standards of Professional Conduct?

    A. Yes.
    B. Only with respect to risk-arbitrage.
    C. Only with respect to market making.

6. Which of the following acts is *most likely* in violation of the CFA Institute Standards of Professional Conduct?

    A. The brokerage arrangement by Pebble Toss.
    B. The strategy by PINE.
    C. Both the brokerage arrangement by Pebble Toss and the strategy by PINE.

Questions 7 through 12 relate to Quantitative Methods

Brittany Ruiz Case Scenario

Brittany Ruiz is the chief investment officer (CIO) at Black-Mount Capital Advisory Firm (BMCA), a leading U.S. based money management firm. Last year, BMCA launched the BMCA Equity Fund that invested in stocks of domestic and international markets including those of Russia, Brazil, Canada and U.K. During the fund's annual performance review, Ruiz discovered that the fund earned a return considerably less than that of its benchmark. Concerned with the outcome, Ruiz called a meeting with the fund's portfolio management team to discuss key issues related to quantitative analysis of the fund's investments. Anthony Webb, a leading quantitative expert was invited to chair the meeting. While analyzing the regression models used by the PM team to predict stock returns, Webb requested for the information provided in Exhibit 1. The information relates to a time-series model for annualized monthly returns to a Brazilian stock index.

Exhibit 1: Annualized Monthly Returns to a Brazilian Stock Index

Lag	Autocorrelation
1	0.1320
2	0.1856
3	-0.0098
4	0.0056
5	-0.0062
Critical t-value	1.96
Number of observations	398

After his analysis, Webb presented the following conclusions to the portfolio management team:

Conclusion 1: "This time series can be best modeled using a moving average (2) model rather than an autoregressive model."

Conclusion 2: "A moving average (2) model would be different from a simple moving average because the former model will place different weights on the terms in the moving average. In addition, unlike the moving average (2) model, a simple moving average is based on observed values of the time series."

Since 10% of the BMCA Equity Fund was invested in large-cap Russian stocks, Webb considered it crucial to study the characteristics of the Russian capital markets. While reviewing BMCA's autoregressive (1) model used to predict the Russian inflation rate, Webb suspected that the model might have a unit root. To accurately test for the presence of a unit root in the time series, Webb decided to regress the first difference of the time series on the first lag of the time series. After obtaining the results of the regression, Webb calculated the t-statistic in the conventional manner for the coefficient. He then used the critical t-values computed by Dickey and Fuller to determine significance. Since he could not reject the null hypothesis at the 5% significance level, Webb concluded that the series did not have a unit root and was stationary.

When talking to Ruiz about 'random walks' Webb stated that a time-series that was a random walk could not be analyzed using standard regression analysis. He made the following comments:

Statement 1: "For a random walk, there is no finite mean-reverting level. In addition, the variance of the time-series increases or decreases as we go further into the future without any lower or upper bound. This violates the assumption of a finite variance for the time-series."

Statement 2: "To model a random walk, we should first-difference it. This results in a mean-reverting level of 0. In addition, the variance of a first-differenced time-series is not only finite, but is also constant. The time-series then becomes covariance stationary."

Webb continued by stating that if a time-series is a random walk, it is best to model the first-differenced series with an autoregressive model to predict future movements in the time-series. He also stated that the key to choosing the correct model was to analyze each model's R^2: the first-differenced AR model would generally have an R^2 greater than the R^2 of the original AR model for a random walk, since the first-differenced model better fits the data.

Ruiz then asked Webb to help the team decide which model to use to forecast the Canadian interest rate: An AR(1) forecasting model of Canadian interest rates and an AR(2) model of Canadian rates. Ruiz presented Webb with the following information:

- The standard errors from the AR(1) model and the AR(2) model were 4.359 and 4.109 respectively.

- Using a sample period from 1985 to 2010, the AR(1) model's residuals exhibit serial correlation, but the AR(2) model is correctly specified.

- For a shorter sample period from 1995 to 2010 both models were correctly specified.

- The root mean squared error from the AR(1) model was 4.213 and from the AR(2) model was 4.250.

- The Canadian interest rate showed considerable volatility from 1985-2010, with values becoming much larger after 1995.

As an ending note, Webb explained the presence of conditional heteroskedasticity to BMCA's portfolio management team. He stated that if a time-series model was conditionally heteroskedastic, then the standard errors of the regression coefficients would be incorrect, and the hypothesis tests would be invalid. He added that this was true only for autoregressive models but not for moving-average models or autoregressive moving-average models.

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7. Webb is *most* accurate with respect to:

   A. Conclusion 1 only.
   B. Conclusion 2 only.
   C. both Conclusion 1 and conclusion 2.

8. Is Webb's conclusion regarding the presence of a unit root in the inflation rate time-series *most likely* correct?

   A. Yes.
   B. No, because the regression variables that he used and his computed t-statistic is incorrect.
   C. No, because his application of the regression-based unit root test was incorrect.

9. Webb is *most* accurate with respect to:

   A. statement 1 only.
   B. statement 2 only.
   C. neither statement 1 nor statement 2.

10. With regard to his comments about random walks, Webb is *most likely*:

    A. correct.
    B. incorrect about the criterion of choosing the correct model.
    C. incorrect about the use of first-differenced AR models and about the criterion of choosing the correct model.

11. For predicting the Canadian interest rates, which model should *most likely* be used:

    A. the AR(1) model.
    B. the AR(2) model.
    C. neither the AR(1) model nor the AR(2) model.

12. With respect to his comment about conditional heteroskedasticity, Webb is *most likely*:

    A. correct.
    B. incorrect with respect to autoregressive moving-average models.
    C. incorrect with respect to autoregressive moving-average models and moving-average models.

Questions 13 through 18 relate to Economics

Sapphire Financial Strategists Case Scenario

Sapphire Financial Strategists (SFS), a U.S. based capital management firm, has received considerable critical acclaim from several financial journals and capital analysts. Rebecca Stephan, a portfolio manager, and the CEO at the firm, has played a pivotal role in the success of the firm. To further the company's achievements, Stephan launched the SFS Global Fund, an investment vehicle for investors with the desire to invest in international stocks and bonds. Stephan appointed Jeffery Harnish, a financial analyst and exchange rate specialist, as the head of the fund's portfolio management team. During the team's initial meeting, Harnish presented the following investment opportunities:

Opportunity 1: "Investing money in Australian fixed-income will prove profitable. This is because Australia's one-year deposit rate is 6% whereas that of the U.S. is 3.5% so a higher yield can be captured. The fact that the AUD is expected to depreciate by 1.0% over the investment horizon, supports the profitability of this investment."

Opportunity 2: "I have been deciding whether to invest in Canadian or Japanese fixed-income. Based on my analysis, the nominal interest rates in Canada and Japan are 6.0% and 8.0% respectively. Also, the annual inflation rate in Japan is 5.0%. Assuming the Fisher effect holds, I believe that inflation in Canada will be almost 3.0%. This means that the Japanese Yen will depreciate by 2.0% relative to the CAD over our investment horizon."

Opportunity 3: I strongly recommend entering into a carry-trade position based on borrowing the British pound and investing in the Australian dollar. I have gathered the following information to support my decision.

Exhibit 1

Currency	One-year rate at T_0	Currency pair	Spot Rate at T_0	Spot Rate at T_1
GBP	2.75%	GBP/USD	0.817	0.804
AUD	6.00%	USD/AUD	0.975	0.978

This will ensure that we earn a positive return on our trade."

After the meeting was over, Harnish was approached by Tammy Lee, a currency overlay manager at SFS, to discuss foreign exchange carry trades in detail. Lee stated that he had entered into a carry trade with the euro as the funding currency. He added that the inflation rate in the U.S. was 2.5% greater than the inflation rate in the euro area. After explaining the details to Harnish, Lee expressed his concern for the profitability of his trade given the high risks embedded in such strategies. To advise him, Harnish made the following comment:

"I believe you should exit your strategy if the U.S. dollar starts to depreciate in value by 2.0% relative to the euro, or when the euro starts to appreciate in value relative to the dollar by more than 2.0%."

Lee then asked Harnish to elucidate the influence of current account trends on the path of exchange rates over time. Harnish made the following comments:

Statement 1: "If a country imported more goods than it exported, its currency would adjust to this current account deficit, causing it to depreciate."

Statement 2: "Due to the debt sustainability channel, if a country runs a large and persistent current account deficit, not only will its currency depreciate, but the currency's real long-run equilibrium value would also be revised downward."

Statement 3: "If Country A has a large current account deficit relative to Country B, Country A will most likely experience a build-up of its holding of Country B's, and any attempts to reduce the holding would result in a depreciation in Country A's currency relative to Country B's currency."

13. With respect to Opportunity 1, which of the following would *least likely* erode the profitability of the investment?

   A. The *ex ante* PPP and Fisher effects hold.
   B. The covered interest rate parity holds.
   C. The uncovered interest rate parity holds.

14. With respect to Opportunity 2, is Harnish's analysis *most likely* accurate?

    A. Yes, because the Fisher effect captures the relationship between interest rates and inflation, and ultimately explains their effect on exchange rate movements.
    B. No, because the relationship explained by Harnish is the *ex ante* purchasing power parity, not the Fisher effect.
    C. No, because Harnish has overlooked a major assumption underlying the Fisher effect which will affect his calculations.

15. With regard to Opportunity 3, the all-in return to the trade, measured in GBP terms, would be *closest* to:

    A. 1.89%.
    B. 3.99%.
    C. 4.64%.

16. With regard to his comment to Lee, Harnish is *most likely* advising to manage crash risk by using:

    A. purchasing power parity (PPP) benchmarks, but he is incorrect as to when to exit the strategy.
    B. Uncovered interest rate parity as a benchmark, and he is correct as to when to exit the strategy.
    C. PPP benchmarks, and he is correct as to when to exit the strategy.

17. Is Harnish's Statement 2 *most likely* correct, and with regard to Statement 1, what will *most likely* cause the country's currency to depreciate less in order to correct the trade balance?

    A. Yes; and export demand being more price elastic than import demand will cause the currency to depreciate less.
    B. No; and import prices rising by more than the decrease in export prices will cause the currency to depreciate less.
    C. No; and a smaller initial gap between exports and imports will cause the currency to depreciate less.

18. With respect to Statement 3, what mechanism of exchange rate correction is Harnish *most likely* referring to, and is his statement correct?

    A. The debt sustainability channel, and the statement is correct.
    B. The portfolio balance channel, and the statement is incorrect.
    C. The portfolio balance channel, and the statement is correct.

Questions 19 through 24 relate to Corporate Finance

Courtney Hagen Case Scenario

Courtney Hagen worked as a financial consultant for a number of U.S. based sell-side firms before joining Discoverers Company Limited (DCL), an electronics firm specializing in components used by automobile firms. DCL is contemplating investment in a high-tech machine that is expected to significantly increase its production efficiency. Hagen has been advised to choose from the following available options:

Option 1: A machine with a useful life of 3 years that requires an initial investment of $32,500. The investment is expected to return $13,700, $15,900 and $17,000 during its three years of useful life respectively.

Option 2: A machine with a useful life of 4 years that requires an initial investment of $40,000. The cash flows from the investment equal $12,000, $14,500, $25,000 and $7,000 respectively.

Both projects have a 12% required rate of return. Given that the machines will be replaced regularly, Hagen plans to be particularly careful in selecting the right option. Hagen decided to discuss her analytical technique with Nancy Harland, one of DCL's corporate finance experts. Harland mentioned approaches to assessing the profitability of each option:

1. The Least Common Multiple Approach.
2. The Equivalent Annual Annuity Approach.

When talking about these approaches with Hagen, Harland made the following comment: "The above two approaches to comparing investment projects are each based on solid financial rationale. However, they can sometimes yield conflicting results. In such cases, analysts must use their judgment to determine which approach more accurately reflects reality."

After completing her analysis, Hagen was asked to assess a capital project with the following characteristics:

- The initial outlay is $155,000.
- The project life is three years.
- Annual after-tax operating cash flows have a 50% probability of being $25,000 per year and a 50% probability of being $75,000 per year.
- Salvage value at termination is zero and the required rate of return is 11%.

DCL has the option of abandoning the project after one year and receive a salvage value of $120,000. Hagen has been asked to advise the board whether to invest in the project or not.

After completing her assignments for the day, Hagen proceeded with learning more about capital budgeting and investment decisions. When reading a book on 'Capital Budgeting', Hagen discovered the existence of a number of alternative procedures to the widely employed capital budgeting model. The book presented the following models:

- Economic Profit Model
- Residual Income Model
- Claims Valuation Model

Hagen was intrigued with the analytical basis of the models as explained by the application of these models to a hypothetical company. To test his understanding of the procedures, Hagen decided to recalculate company value after making the following changes:

1. Increasing the depreciation estimate by 20%.
2. Increasing the after-tax gain from salvage value by 15%.
3. Increasing the cost of debt by 10% but keeping the cost of equity unchanged.

After performing the necessary calculations, Hagen formulated the following conclusions considering each of the changes in isolation:

Conclusion 1: "Change 1 will increase the value of the company under the economic profit model relative to the residual income model, since it will decrease the dollar cost of capital, or the capital charge. Change 2 however, will increase the value of the company by the same amount under both methods."

Conclusion 2: "Change 3 will decrease the market value added under the economic profit model. Also, the new company value under the residual income model and the claims valuation model will decrease."

Hagen decided to mention these alternative approaches to the DCL's executives at their next meeting. Although Hagen acknowledged the rationale of their use, she was not sure under what circumstances was each of them appropriate. She planned to discuss this during the meeting too.

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19. Using the EAA approach, Hagen should *most likely* choose:

   A. Option 1.
   B. Option 2.
   C. neither Option 1 nor Option 2.

20. With respect to her comment about the two approaches, Harland is *most likely*:

   A. correct.
   B. incorrect, because both methods will always result in the same decision.
   C. incorrect, because the least common multiple approach is closer to the NPV criterion and hence, is superior to the EAA approach.

21. With regards to the abandonment option, the capital project that Hagen is analyzing has an NPV if DCL does not abandon that is:

   A. $28.279 greater than the NPV if DCL plans to abandon the project.
   B. $24,369 less than the NPV if DCL plans to abandon the project.
   C. $52,648 greater than the NPV if DCL plans to abandon the project.

22. With regard to the capital project that Hagen is analyzing, optimal abandonment raises the NPV by:

   A. $26,324.
   B. $34,769.
   C. $61,093.

23. Hagen is *most* accurate with respect to:

    A. Conclusion 1 only.
    B. Conclusion 2 only.
    C. Both conclusions 1 and 2.

24. Which of the following investors are *least likely* to use the 'claims valuation approach'?

    A. Real estate investors.
    B. Corporate managers.
    C. Security analysts.

Questions 25 through 30 relate to Financial Reporting and Analysis

Hawk Investments Case Scenario

Hawk Investments (HAWIN) is a U.S. based financial advisory firm that just recently started business in the institutional sector of the domestic capital market. Ron Johnson heads the research department of the firm and is currently working with three research analysts to assess the existing investment potential of the global automobile sector. Jennie Cooks has been assigned the task of evaluating the financial statements of Full-Circle Automobiles (FCA), a U.S. based automobile firm with operations worldwide. FCA established a subsidiary last year in an emerging economy due to an anticipated increase in the local demand for FCA's products. Although the economy experienced a GDP growth rate of more than 5.00% over the past three years, the inflation rate was over 27%/year over the same period. As a result of the high inflation, the currency of the country lost almost half of its purchasing power by the end of 2010. Exhibits 1, 2 and 3 display some key financial and market information that Cooks gathered to further her analysis.

Exhibit 1
Key Information from Foreign Subsidiary's Financial Statements
(in foreign currency units FC)

(in FC millions)	31 Dec 2009	31 Dec 2010
Cash	3,500	5,600
Inventory	15,000	15,000
Property, plant and equipment	33,000	33,000
Notes payable	17,500	19,500
Non-monetary liabilities	9,000	9,000
Retained earnings	0	2,700
Revenues	4,000	
Expenses	850	

*Capital stock equaled $25,000 in the beginning and end of 2010

Exhibit 2
Foreign Currency Price Index 2010

Beginning value	100
Average value	175
Ending value	200

Exhibit 3
Exchange Rate

	US $ per FC
1 January 2010	0.875
Average 2010	0.702
Current Rate	0.4375

When discussing the financial numbers with Johnson, Cooks made the following comment:

"Relative to the translated net income under U.S. GAAP, the dollar net income under IFRS related to the foreign subsidiary for the year 2010 is higher."

Johnson agreed and replied with the following comment:

"I prefer using the translation approach required by IFRS since this method, equivalent to doing an appraisal, best represents economic reality."

During their discussion Cooks mentioned that FCA also operated a subsidiary in the European market. She stated that during the past year, FCA's board of directors instructed to sell a considerable portion of the subsidiary's inventory to pay off a large portion of its long-term debt. In addition, as part of the subsidiary's capital budgeting decisions, an upcoming purchase of land was to be financed by the issuance of common stock rather than a bank loan. During the same year, the euro appreciated relative to the dollar.

To increase her knowledge about the effects of translation methods on the financial statements of a multinational company, Cooks stated the example of a hypothetical U.S. based multinational firm with just one subsidiary operating in Canada. Cooks posed the following questions to Johnson with regard to the current rate method and temporal method:

Question 1: "Assuming the Canadian dollar weakens against the US dollar, and the subsidiary has a larger amount of monetary assets than monetary liabilities, how will the net income under the two translation methods compare?"

Question 2: "What will be the effect on the firm's financial ratios of translating the Canadian subsidiaries' financial statements under the two methods?"

Johnson answered with the following statements:

Answer 1: "The net income under the temporal method would be greater than the net income under the current rate method."

Answer 2: "Under the current rate method, many of the underlying relationships of the Canadian subsidiary in CAD will be preserved after translation if ratios are calculated from a single financial statement. However, under the temporal method, most of these relationships will be distorted.

Johnson concluded their conversation with a discussion about disclosure requirements related to translation methods under IFRS and U.S. GAAP. He made the following comment:

"Both IFRS and U.S. GAAP require two types of disclosures:

- the amount of exchange differences recognized in net income, and
- the amount of cumulative translation adjustment along with a reconciliation of the amount.

In addition, under the U.S. GAAP, companies are required to disclose the two separate amounts that constitute the total exchange difference recognized in net income."

25. Assuming PPP holds, Cooks comment with regards to translated net income is *most likely*:

   A. correct.
   B. incorrect, because the dollar net income under IFRS will be lower.
   C. incorrect, because the dollar net income under IFRS would be the same.

26. Is Johnson correct about his comment regarding preference of the IFRS approach, and what is the net purchasing power gain/loss under IFRS, as of Dec 31 2010?

   A. No, and the net purchasing power gain is $6,119.
   B. No, and the net purchasing power gain is $13,986.
   C. Yes, and the net purchasing power gain is $10,056.

27. Using the information provided in Exhibits 1, 2 and 3, the translated retained earnings under IFRS will be *closest* to:

   A. $87.5.
   B. $3,302.
   C. $6,169.

28. Regarding the subsidiary in the European market, FCA *most likely* translates its financial statements using:

   A. the current rate method.
   B. the temporal method.
   C. either the current rate method or the temporal method.

29. Johnson is *most* accurate with respect to:

   A. Answer 1 only.
   B. Answer 2 only.
   C. Both answers 1 and 2.

30. With respect to his comment regarding disclosure requirements, Johnson is *most likely*:

   A. incorrect.
   B. correct only with respect to IFRS.
   C. correct only with respect to U.S. GAAP.

Questions 31 through 36 relate to Financial Reporting and Analysis

Primary Medical Associates Case Scenario

Primary Medical Associates (PMA) operates a chain of medical care centers for senior citizens across the UK. PMA has made a number of acquisitions in the recent past and has always relied on the acquisition method for consolidation purposes.

PMA operates a centralized post-employment health-care plan which provides medical care services to all employees serving any of the PMA chains. Barry Richards is a financial analyst serving PMA. Richards is evaluating the assumptions made by PMA to estimate the plan's obligations and expenses. He aims to compare the assumptions to a competing health care provider, Seneca, and determine the impact on their respective financial statements. The respective assumptions are as follows:

PMA: Near-term inflation in health costs is assumed to be 10% and will decline to a long-term rate of 4% twelve years from today.

Seneca: Near-term inflation in health care costs in the current year is assumed to be 6% and will decline to a long-term rate 4% eight years from today.

After evaluating the health care plans, Richards evaluates how the combined balance sheets of PMA and its various subsidiaries would have differed if the united interests method were used instead of the current acquisition method. Exhibit 1 summarizes the results of his analysis.

Exhibit 1:
Acquisition Method Versus Uniting of Interests Method

	Relative Results Under Uniting of Interests Method
Common stock (Par value < Fair value)	Lower
Assets (Book value > Fair value)	Higher
Retained earnings	Lower

In the current year (2016), PMA has entered into a 60/40 joint venture with Prime care, a competing medical services provider in which PMA has 60% voting control. Prior to combining financial results, Richards would like to compare the results achieved under the equity and proportionate consolidation methods. Exhibit 2 summarizes selective financial information for PMA and the joint venture.

Exhibit 2 (In $ Millions)

	PMA-only	Joint Venture
Net receivables	45	115
Total assets	125	280
Total liabilities	62	148
Revenues	1,125	3,750
Expenses	830	1,150
Net income	800	2,120

After reading PMA's financial statement disclosures, Richards learns that the company created Lifeline, a special purpose entity (SPE), in 2015. PAM possesses a 30% share ownership of Lifeline while the remainder is owned by a financial institution. Under the ownership arrangement, PMA will absorb a majority of Lifeline's losses while the financial institution will receive majority of the SPE's residual returns.

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31. Based on the assumptions obtained from the note disclosures, the company to report a higher benefit obligation and period costs is:

   A. Seneca based on the ultimate health care trend rate.
   B. PMA based on the initial percentage increase in health care costs.
   C. Seneca based on the number of years taken to realize the ultimate health care trend rate.

32. Based on the results collected in Exhibit 1, Richards is *most* accurate regarding PMA's:

   A. assets.
   B. common stock.
   C. retained earnings.

33. If Richards employs the proportionate consolidation method for the joint venture, net income to be reported on PMA's income statement will be equal to (in millions):

   A. $1,272.
   B. $1,648.
   C. $2,072.

34. If PMA uses the equity to account for the joint venture, investment account to be reported on its financial statements immediately upon consolidation will equal (in millions):

    A. $79.20.
    B. $125.00
    C. $204.20

35. Which of the following ratios will be lower if PMA opts for proportionate consolidation over the equity method to account for the joint venture?

    A. Net profit margin
    B. Receivables turnover
    C. Total liabilities-to-equity

36. Which company must consolidate Lifeline on its financial statements?

    A. PMA
    B. The financial institution
    C. Both PMA and the financial institution.

Questions 37 through 42 relate to Equity Investments

Paul Marcus Case Scenario

Paul Marcus, a financial strategist and portfolio manager, is particularly interested in valuation based on comparables. Marcus is currently working with Bob Mervak, a research analyst, to value two steel companies using market-based valuation measures. Marcus plans to use the enterprise value to EBITDA ratio to determine relative over or undervaluation of the firms. Selected financial information of the two firms: Silver Steel Inc. and Caveworks Steel Ltd, is presented in Exhibit 1.

Exhibit 1
Selected Financial Information as of December 2010 (in US$ millions)

	Silver Steel Inc.	Caveworks Steel Ltd.
Accounts payable	$65,000	$47,500
Long-term debt	1,120	750
Total current assets	2,985	2,076
Common stock shares outstanding	250	300
Current assets net of cash and short-term investments	1,540	822
Return on invested capital	5.10%	7.50%
Annual revenue growth	18.99%	10.23%
Debt to equity	23.01%	15.67%
Net Income	952	799
Interest	66	37
Taxes	231	111
Depreciation and Amortization	379	355

*Depreciation expenses match capital expenditures for each firm. Silver Steel's stock price is $35, whereas Caveworks's stock price is $41.

When talking to Mervak about the usefulness of his chosen metric, Marcus made the following comments:

Statement 1: "The enterprise value to EBITDA measure is particularly useful in this case. Unlike the price to earnings measure, this measure provides a more appropriate comparison of the companies since they have a considerable difference in their debt to equity ratios."

Statement 2: "The EV/EBITDA multiple will also reflect differences in Silver Steel's and Caveworks Steel's capital programs. Since both companies are capital-intensive, the use of this multiple is particularly useful in this case."

Before their discussion concluded, Mervak mentioned the growing use of momentum valuation indicators among analysts. He stated that such valuation indicators were increasingly being used in selecting investments during portfolio construction, but was not sure how they were used. He presented the following information to Marcus about two companies' SUE scores.

Exhibit 2
Earnings surprise and SUE scores as of the last quarter of 2009 (in US dollars)

	Mean Consensus EPS forecast	Percentage Surprise	SUE score
Company A	15.00	75	5.89
Company B	75.00	50	4.55

After reviewing the data provided, Marcus formulated the following conclusions:

Conclusion 1: "Given the information provided in Exhibit 2 is accurate, in the past, the consensus forecasts for Company B were less accurate than the consensus forecasts for Company A."

Conclusion 2: "Using the variability in analysts' EPS estimates for Company B, the scaled earnings surprise for Company A equals 1.365."

Mervak continued by inquiring about residual income valuation models. He asked how such models compared to other present value approaches. Marcus made the following comments about the strengths of residual income approaches:

Strength 1:   "The uncertainty associated with the valuation estimate derived from the residual income model is significantly less than the uncertainty of the valuation estimate calculated using other present value models."

Strength 2:   "If the clean surplus relationship holds, the two components of the model: book value and future earnings, will have a balancing effect on each other. Hence, aggressive accounting practices that report a higher book value will not result in a higher valuation estimate relative to conservative accounting practices reporting a lower book value."

As part of his last assignment, Marcus is using the historical returns on a broad-based market price index from 1999-2010 to determine an estimate of the equity risk premium inherent in the European capital market. He gathered the following facts in a vignette to assist his analysis:

1. During 2005-2010 businesses in the European market flourished and real productivity increased beyond expectations. However, the inflation rate rose by 3% during the same time period.

2. Analysts' consensus estimate for Europe's equity risk premium relative to bills was 11.50% and relative to bonds was 13.04%.

Marcus used the mean historical return to estimate the risk premium. Relative to the U.S. equity risk premium, Marcus's estimate for Europe's risk premium was notably higher.

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37. Based solely on the information provided in Exhibit 1, how does the valuation of Silver Steel Inc. compare with that of Caveworks?

    A. Silver Steel Inc. appears to be undervalued.
    B. Caveworks Steel Inc. appears to be undervalued.
    C. The comparison appears to be inconclusive.

38. Marcus is *least* accurate with respect to:

    A. Statement 2 only.
    B. Both statements 1 and 2.
    C. neither statement 1 nor statement 2.

39. Marcus is *most* accurate with respect to:

    A. conclusion 1 only.
    B. both conclusions 1 and 2.
    C. neither conclusion 1 nor conclusion 2.

40. Marcus is *most* accurate with respect to:

    A. Strength 1 only.
    B. both strengths 1 and 2.
    C. neither strength 1 nor strength 2.

41. Based solely on the information provided in the vignette, Marcus's estimate for the equity risk premium will *most likely* be:

    A. biased upward.
    B. biased downward.
    C. either biased upward or biased downward.

42. Given the information in Marcus's vignette, which of the following is *most likely* true about the U.S. and European capital markets?

    A. The European yield curve is downward sloping.
    B. The historical time series used by Marcus is stationary.
    C. For the European market, the geometric mean return will equal the arithmetic mean return.

Questions 43 through 48 relate to Equity Investments

Jackie Lee Case Scenario

Jackie Lee is an equity analyst at Core Money Management (CMM), a U.S. based firm that invests in domestic and international equity markets. The Core Equity Fund (CEF), launched by CMM almost three years ago, has managed to attract a number of wealthy private wealth clients. In the recent year, CEF's performance corresponded to the top half of the first decile of comparable equity funds ranked according to their recent annual rates of return. Lee was part of the investment selection team for CEF, and is now considering several potential options for inclusion in the fund. As a first step towards determining the attractiveness of the investments, Lee is establishing the over or undervaluation of the U.S. equity market as a whole. Exhibit 1 displays the information Lee has collected.

Exhibit 1
Forecasted values for selected financial and economic variables of the U.S. market

Inflation rate	4.5%
Nominal GDP growth rate	7.8%
Forward dividend yield	5.5%
Market's reinvestment return	2.0%
Equity risk premium	16%
Risk-free rate	3.2%

While noting down the key outcomes of his analysis, Lee wrote the following statement as a side-note:

"Using the price-earnings multiple as a benchmark, the return from capital appreciation for the U.S. market will be greater than the earnings growth rate."

Lee is contemplating the addition of utility stocks to the CEF to enhance diversification benefits. One such stock is that of Sintock Utilities, a publicly traded firm in the utilities sector. For the purpose of valuing this stock Lee determined the following values (Exhibit 2):

Exhibit 2
Sintock Utilities

5-year beta estimate	0.76
10-year beta estimate	0.65
U.S. equity risk premium relative to bonds	6.5%
U.S. equity risk premium relative to bills	7.7%
30-day T-bills YTM	2.5%
20-year U.S. government bonds YTM	3.8%

Lee is planning to use the most common industry practices for estimating Sintock stock's required return. In addition, he believes that an adjusted beta with two-third weight of measured beta best reflects economic reality. To confirm his calculations, Lee contacts an equity analyst who puts Sinstock's required return on equity at 10.3%. Both Lee and the equity analyst have opted for government bonds over bills for deriving their required return estimate.

Lee is also evaluating an equity stake in a private company and is using a public comparable's beta as a benchmark for his calculations. The private company is 30% funded with debt. The benchmark, however, has 70% debt in its capital structure which is very close to the industry average. Lee's estimated beta equaled 1.2. When comparing his beta estimation with that of other analysts, Lee found out that an analyst that benchmarked the required return on a median industry beta recorded a beta of 0.70.

Lee is writing an article on 'Equity Valuation" that contrasts various models used to determine the required return on equity. In the article, Lee made the following comments about the Fama-French model:

Statement 1: "Similar to other multifactor models, this model has factor betas representing an asset's sensitivity to a factor holding other factors constant, and risk premiums representing the expected return accruing to the asset with unit sensitivity to a factor and zero sensitivity to all other factors, in excess of the risk-free rate."

Statement 2: "The size and value factor betas, only if greater than 1, represent a small-cap, value stock respectively. Similarly the market beta, only if greater than 1 represents above-average systematic risk."

Lee received $50,000 as a bonus as part of CMM's performance-based compensation plan. Lee plans to invest the money in European equities for the coming year. Lee wants to find the present value of the cash flow to be received on his investment. The current European market is characterized by an inverted yield curve and high inflation. The current bill rate is 10.5% and the current bond rate is 7.0%. The bill-relative and bond-relative risk premia estimates are 6.5% and 6.0% respectively. Lee is not sure what discount rate to use to find the present value of his investment return.

43. Assuming the information provided in Exhibit 1 is accurate, is the statement written as a side-note by Lee *most likely* accurate?

    A. Yes.
    B. No, because the capital appreciation for the U.S. market will be less than the earnings growth rate.
    C. No, because the capital appreciation for the U.S. market will equal the earnings growth rate.

44. Using the CAPM, Lee's estimate of Sinstock's required return is *most likely*:

    A. 2.05% less than the analyst's estimate, who most likely assumes the stock has below-average systematic risk.
    B. 1.04% less than the analyst's estimate, who most likely assumes the stock has average systematic risk.
    C. 1.52% less than the analyst's estimate, who most likely assumes the stock has above-average systematic risk.

45. Based on the information provided in the vignette, with regards to the private company that Lee is valuing, which of the following is *most* accurate? Lee's benchmark has systematic risk that is:

    A. 1.17 points greater than the median industry risk.
    B. 0.45 points less than the median industry risk.
    C. 0.50 points greater than the median industry risk.

46. Lee is *most* accurate with respect to:

    A. Statement 2 only.
    B. both statements 1 and 2.
    C. neither statement 1 nor statement 2.

47. The discount rate that Lee should use to value his European investment is *closest* to:

    A. 17%, since short-term rates are more plausible in this case.
    B. 13%, since an inverted yield curve predicts a downward path for short-rates and inflation.
    C. 16.5%, since risk premium should always be relative to bonds, but the risk-free rate is most appropriately represented using the bill-rate.

48. Which of the following about the Fama-French model is *most* accurate?

    A. The return on the market in the Fama-French model is determined by subtracting the one-month T-bill rate from the return on a market value-weighted equity index.
    B. If, in the coming year, growth stocks are expected to outperform value stocks, the value premium in the Fama-French model would be negative.
    C. The liquidity premium in an extended Fama-French model refers to the marketability of the investment; the lower the marketability, the greater the premium.

Questions 49 through 54 relate to Fixed Income

Thornton Holmes (TH) Case Scenario

Thornton Holmes (TH) is an advisory firm, which offers security valuation and analysis services to asset management firms. Rupert Singh, TH's senior fixed income analyst is valuing three fixed-rate corporate bonds issued by Bridgedale Manufacturers (BM) on the date of evaluation and each with a stated maturity of three years. Details concerning the three issues are summarized in an exhibit (Exhibit 1).

Exhibit 1:
Fixed-rate Corporate Bonds Issued by BM

Issue	Price per 100 par ($)	Coupon rate (%)	Embedded Option?	Call Date*
A	?	6	Yes	Two years from now
B	101.655	6	Yes	One year from now
C	102.592	6	No	N/A

*Callable at par

At the time of evaluation, the spot rate curve is flat at 5%. Singh uses a 15% volatility assumption to calibrate the binomial interest rate tree (Exhibit 2).

Exhibit 2: Binomial Interest Rate Tree
Using a 15% Volatility Assumption

Year 0	Year 1	Year 2
5%	5.809%	6.749%
	4.304%	5.000%
		3.704%

The yield curve is forecasted to experience a downward parallel shift by 2% in the coming few months. Singh attempts to project the impact of the yield curve shift on the effective durations of the three issues by considering two alternative scenarios.

Scenario 1: Effective durations of Bond A and Bond B will decline by 0.7% and 1.5% respectively.

Scenario 2: Yield curve rises in a parallel shift of 2% .

After presenting the scenarios, Singh calculates the impact on the price of the bond underlying Bond B if Scenario 2 materializes.

June Walsh is Singh's colleague. Contrary to Singh, Walsh projects the yield curve to steepen and recommends her colleague to employ key rate durations to analyze the impact of yield changes on bond prices.

Based on Walsh's forecast, Singh concludes that if the yield curve steepens, a shift in any of the par rates other than the three year rate will have no effect on the value of Bond C. Singh's final task is to value a convertible bond issued by Scale Tech. She is particularly interested in assessing the impact of Walsh's forecast on the value of the embedded option. The Scale Tech convertible does not have embedded call and put options.

49. Using Exhibits 1 and 2, the value of Bond A's embedded call option (per 100 of par) is *closest* to:

   A. $0.157.
   B. $0.937.
   C. $1.712.

50. Which of the following is *least accurate*? Compared to Bond A and B, Bond C's price

   A. will change more when interest rates decrease
   B. volatility will be higher for change in interest rates
   C. will not be higher at any given market interest rate

51. Considering Scenario 2 in isolation, duration of Bond B compared to Bond C will:

   A. change less
   B. change more
   C. change exactly same as both bonds are of same maturity.

52. Considering Scenario 2 in isolation, relative to Bond B, the price of Bond C will:

   A. decrease more and will be at a discount to par
   B. decrease more and can be at a discount or premium or at par
   C. decrease less and will be at a discount to par.

53. Singh's conclusion is *most likely*:

   A. correct.
   B. incorrect; shifting any of the par rates will impact bond value.
   C. incorrect; shifting the three year par rate will have effect on bond value.

54. Walsh's forecast will *most likely* result in the value of the conversion option:

   A. increasing.
   B. decreasing.
   C. remaining unchanged.

Questions 55 through 60 relate to Derivatives

Scales Ltd. Case Scenario

Scales Ltd is a manufacturing concern which specializes in the design and production of industrial equipment. The company intends to commence construction of a sales center seven months from today and will need to borrow Krona 10 million for a period of three months for the project. The company's management fears that interest rates will significantly rise by the time the borrowing is arranged and consults Martin Lee, an external derivatives specialist.

Lee prescribes the following two options to hedge the risk of an interest rate hike:

Option 1: Enter into a 7 × 10 FRA as the fixed rate payer at a rate of 5.5%.

Option 2: Enter into a 7-month receive floating/pay fixed interest rate swap with a quarterly reset and a 30/360 day count.

Lee arranges a meeting with company management in which he compares option 1 to a position of 7- and 10-month LIBOR deposits by making the following statement:

Statement 1: "Scales Ltd's FRA position will effectively replicate a long 7-month LIBOR deposit and a short 10-month LIBOR deposit."

Prior to making a final decision, Scales Ltd's senior financial officer, Serena Ali, asks Lee how the pricing of the interest rate swap can be compared to that of the FRA. Lee responds as follows:

Statement 2: "The FRA contract is assumed to be either advanced set/advanced settled or advanced set/settled in arrears. This contrasts with the interest rate swap in which the floating rate is set at the initiation of the swap and paid over a period of time."

Ali also asks the rate Scales Ltd would obtain on the interest rate swap if option 2 is exercised. Lee responds by stating that the swap will be priced assuming the position is equivalent to issuing a fixed rate bond and buying a floating rate bond. The discount factors to be used for pricing are presented in Exhibit 1.

Exhibit 1

Maturity (Days)	Discount Rate
60	0.9905
90	0.9782
180	0.9625
210	0.9502
270	0.9311

After considerable discussion with Lee, Ali consents to Option 1. Sixty days after entering into the agreement, the LIBOR term structure shifts as demonstrated in Exhibit 2. Lee attempts to value the FRA assuming the discount rate is the Krona 8-month LIBOR.

Exhibit 2

Days	LIBOR (%)
60	2.5
90	3.0
150	4.8
180	5.9
210	7.2
240	8.3

After concluding the meeting, Lee reads an article on the Black model. The article begins with a comparison of the Black model and the BSM model. The article states that the former is more appropriate to value options when the underlying is costless to carry. The article then goes on to present an illustration of how the Black model can be applied to value a European-style futures option on the OMX Stockholm 30 equity index futures. Exhibit 3 summarizes the data to be used in the analysis.

Exhibit 3

Current index level	1,520
Futures contract price	1,340
Exercise price	1,520
$N(d_1)$	0.510
$N(d_2)$	0.480
$N(-d_1)$	0.490
$N(-d_2)$	0.520

The article concludes by analyzing how the BSM model is applied to value stocks. After exploring model assumptions such as frictionless markets, constant and known volatility, and continuous prices, the article summarizes the limitations of the model if the assumptions fail to hold in the following excerpts:

Excerpt 1: "Markets can move discontinuously and contrary to the BSM's model assumptions, which results in imperfect hedging."

Excerpt 2: "Volatility is not known in advance and in order to continue using the model, the volatility of the parameter should be higher than the volatility of the stock expected by market participants."

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55. Is Lee correct with respect to Statement 1?

    A. Yes.
    B. No, the FRA position will effectively replicate a long 7-month LIBOR deposit and a short 3-month LIBOR deposit.
    C. No, the FRA position will effectively replicate a short 7-month LIBOR deposit and a long 10-month LIBOR deposit.

56. Is Lee correct with respect to Statement 2?

    A. Yes.
    B. No, FRA rates can only be advanced set/advanced settled.
    C. No, the floating rate is assumed to be advanced set/settled in arrears.

57. Based on the data in Exhibit 1, the swap fixed rate (Option 2) is *closest* to:

    A. 1.9%.
    B. 7.7%.
    C. 9.6%.

58. The value of the FRA sixty days after contract initiation is *closest* to:

    A. − Krona 115,724.
    B. + Krona 198,042.
    C. + Krona 204,751.

59. Using the data in Exhibit 3, which of the following statements *most* accurately describes how the Black model will be used to value a call option on BMX Stockholm 30 equity index futures? The call value is the present value of the difference between the:

    A. exercise price times 0.480 and the futures price times 0.520.
    B. current futures price times 0.510 and the exercise price times 0.480.
    C. current futures price times 0.490 and the exercise price times 0.520.

60. Which of the following excerpts in the article are *most likely* correct?

    A. Excerpt 1
    B. Excerpt 2
    C. Both of the excerpts.