FinQuiz.com

Level II of CFA® Program

Mock Exam 1
June, 2019

Revision 1

FinQuiz.com – 1ˢᵗ Mock Exam 2019 (AM Session)

Questions	Topic	Minutes
1-6	Ethical and Professional Standards	18
7-12	Quantitative Methods	18
13-18	Economics	18
19-24	Corporate Finance	18
25-36	Financial Reporting and Analysis	36
37-48	Equity Investments	36
49-54	Fixed Income	18
55-60	Derivatives	18
	Total	180

Questions 1 through 6 relate to Ethical and Professional Standards

Sullivan Taka, Ida Young and Paul Singh Case Scenario

Sullivan Taka, Ida Young and Paul Singh are members of an investment club, which offers financial advisory and asset management services to their acquaintances. Club meetings are held over the weekend so as not to disrupt their employment responsibilities.

Taka works at Frank-Walsh, an asset management firm; Young is a research analyst at Victor & Sun, an economic and market research firm; Singh is a trader at Doyle, a broker-dealer.

The members rely on a risk-return forecasting model to make investment recommendations. The model employs simulation techniques to integrate and project the impact of macroeconomic and unique company-specific financial and non-financial factors on security performance. The model was developed by Young during the time he served as an independent analyst. Subsequently, the model was licensed under Victor & Sun's name and rights of ownership were transferred accordingly. Young has obtained permission from her employer to use the model to make investment decisions for the club's clients.

With the consent of Young, Taka introduces the model to his employer by stating, "The model has been developed by a colleague, Ida Young, and is used by the analysts of Victor & Sun to make investment decisions."

The investment club has accepted their first institutional client, Blackthorn Corp. The club will be responsible for managing the investment portfolio of the client's defined benefit pension plan's policy portfolio. Based on the plan's characteristics, including its long-term horizon, an investment policy is designed categorizing risk tolerance as 'above average'. The fund manager has expressly prohibited the inclusion of speculative stocks. Taka believes that cyclical stocks will be most suitable for the portfolio's equity allocation.

A few months pass following the acceptance of Blackthorn as client. The equity allocation of the portfolio generates losses as the economic cycle experiences a downturn. As a result, the plan sponsor reports a deficit on the pension plan. In response to the losses, Singh suggests that the equity allocation be expanded to include venture capital stocks stating that their high return potential and long holding periods makes them desirable given the long time horizon of the client.

All three club members have unanimously decided on formalizing a policy with regards to the responsibilities of members to clients. The drafted policy includes the following points:

1. Best execution must be sought at all times even for client directed brokerage arrangements; this is to ensure that optimal investment decisions are made for client accounts.
2. The policy for selecting client accounts to participate in an order must be fair and equitable.
3. Account holdings should be diversified to minimize the risk of loss unless such an action is otherwise contrary to client objectives.

Doyle's traders rely on research reports, which provide the analysis necessary to assist in making buy and sell decisions for client accounts. Singh's current task is to purchase emerging market equity index stocks for client accounts. However, he lacks the necessary experience and knowledge and relies on a report published by Taka, who is an expert on emerging markets. The report features a full-length discussion on the principal risks, expected returns, and diversification potential of the index stocks. However, the report does not mention the fact that the specific emerging market index being evaluated comprises of stocks likely to be upgraded to developed equity market index. Singh purchases the stocks after careful consideration of their appropriateness for client accounts. He discloses to his clients and employer that he relied on third party research but does not identify Taka as the author.

---

1. Has Young violated the CFA Institute Standards of Professional Conduct by allowing Taka to introduce the model at Frank-Walsh?

   A. No.
   B. Yes, he has violated his duty to his employer.
   C. Yes, he has misrepresented his position with respect to the model.

   Correct Answer: B

   Reference:
   Level II of CFA® Program Volume 1, Study Session 1, Reading 2, LOS a

Young has violated the CFA Institute Standards of Professional Conduct concerning employer loyalty by not asking for the consent of her employer prior to permitting Taka to introduce the model to his firm. The model is the property of Victor & Sun and any attempt to share details of the model or the model itself is construed as violation of employer confidentiality. Furthermore, only Victor & Sun is authorized to give others consent to use firm property and by acting on behalf of the firm, Young is in further violation of the standard.

C is incorrect. The standard concerning misrepresentation is not being violated as Taka has introduced the model as Victor & Sun's property and identifies Young, rightfully, as the creator of the model.

2. The *most* suitable response of the investment professionals to the change in the plan's funded status would be to:

   A. liquidate existing portfolio holdings.
   B. revise the investment policy statement.
   C. subject future investment decisions to the approval of plan beneficiaries.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 1, Study Session 1, Reading 2, LOS a

In response to the change in the funded status, an immediate revision in the client's investment policy statement as well as a reassessment of risk tolerance is required so that all future investment decisions are made in accordance with the revised financial status of the client.

A and C do not represent appropriate responses to the change in the plan's funded status.

3. Singh's suggestion to include venture capital stocks is *most likely:*

   A. unsuitable.
   B. suitable as there is potential to improve the plan's funded status.
   C. suitable considering that the time horizon of the investment will match that of the plan.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 1, Study Session 1, Reading 2, LOS a

The venture capital stocks are unsuitable for the client's policy portfolio regardless of the fact that the investment horizon of the investment strategy is a suitable match to that of the ultimate client (plan beneficiaries). By proposing this asset class Singh has failed to consider the plan sponsor's prohibition of including highly speculative stocks in the portfolio. By their very nature, venture capital equities are highly risky making the security highly inappropriate for the plan's investment portfolio. This holds true regardless of their potential to generate high returns and improve the plan's funded status over the long-term.

4. Is the proposed best execution policy (Policy 1) consistent with the CFA Institute Standards of Professional Conduct?

    A. Yes.
    B. No, there is no requirement to seek best execution if the client expressly states so.
    C. No, seeking best execution is not necessary in client-directed brokerage arrangements.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 1, Study Session 1, Reading 2, LOS a

Members and candidates are required to seek best execution at all times even for client- directed brokerage arrangements. Therefore, the policy is consistent with the CFA Institute Standards of Professional Conduct.

B is incorrect. The only exemption to this standard is when the client expressly prohibits the member or candidate from seeking best execution **and** is aware of the impact on his or her investment account.

5. Considering policies 2 and 3, which of the following is *most* consistent with the CFA Institute Professional Conduct Standards?

    A. Policy 2 only.
    B. Policy 3 only.
    C. Both of the policies.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 1, Study Session 1, Reading 2, LOS b

Policy 2 is consistent with CFA Institute of Standards of Professional Conduct concerning fair dealing, which recommends members and candidates disclose to clients and prospective clients how they select accounts for participating in an order and determine the amount of securities each account will buy and sell. Trade allocation policies should be fair and equitable.

Policy 3 is consistent with the CFA Institute of Standards of Professional Conduct concerning loyalty, prudence and care which recommends members to diversify to reduce risk of loss unless diversification is not consistent with plan guidelines or is contrary to account objectives.

6. With respect to the purchase of emerging market index stocks, Singh is *most likely* in violation of the CFA Institute Standards of Professional Conduct concerning:

    A. suitability.
    B. misrepresentation.
    C. diligence and reasonable basis.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 1, Study Session 1, Reading 2, LOS a

Singh is in violation of the standard concerning diligence and reasonable basis; the analysis in the report is incomplete as it fails to consider an important factor, which has the potential to modify the risk and returns reported by index stocks.

Singh is not in violation of the standard concerning misrepresentation as he has not attempted to make any misrepresentations with respect to his purchase decision.

Singh is not in violation of the standard concerning suitability as he has considered the client's risk and return objectives prior to making the allocation.

Questions 7 through 12 relate to Quantitative Methods

Capital Managers (CAM) Case Scenario

James Diaz is a financial analyst at Capital Managers (CAM), a financial advisory firm operating several branches all over USA. CAM has been established by a group of successful entrepreneurs, each from a different industry. At the firm, Diaz is currently managing the financial portfolio of Bright Education (BED), a foundation providing free education to children less than ten years of age. The portfolio is worth $20 million, and invests both nationally and internationally. In the management of international assets, Diaz is trying to apply statistical techniques to earn abnormal returns. To get a complete understanding of statistical applications in a financial setting, Diaz contacted Jack Thomas, a quantitative expert at the firm. During a discussion with Diaz, Thomas made the following comments:

Statement 1: "The correlation coefficient is a measure of linear association between two variables. Coefficients capture this association numerically and can be computed validly as long as the variances of the two variables and the covariance between them are finite and constant."

Statement 2: "If the correlation between two variables is -1, then if one variable increases by one unit, the other will always decrease by one unit, regardless of the initial value of the first variable."

As the discussion continued, Diaz mentioned that he was trying to determine the relationship between U.S. stock market returns and short-term interest rates. For this, he had calculated the correlation coefficient between annual returns to a U.S. market index and annual interest rates using data of the past twenty years. However, when Thomas reviewed his calculations, he made the following comment:

Statement 3: "Your data set includes three observations that can clearly be termed as outliers. Hence, to make sure that the sample correlation is a reliable measure of the true population correlation, you need to recalculate it after removing the effect of the outliers."

Thomas continued by making the following statement about correlation analysis:

Statement 4: "While determining the relationships between international market returns and the initial dollar investment made, on the one hand, and between initial investment and risk, on the other, I found out that there was a strong positive relationship between return and risk. This shows that investing in high risk investments will yield higher returns."

Diaz just invested 2% of BED's portfolio in high-yield U.S. corporate bonds. When Thomas asked him why he did so, Diaz stated there was a high positive and significant correlation between short-term interest rates and bond yields and that U.S. interest rates were expected to decrease. However, when Thomas performed his own calculations, he stated that the correlation, though high and positive, was not significant and hence, the strategy may prove to be unfruitful. Even so, Diaz gathered the following information to estimate the regression equation for the bond yield and interest rates.

Exhibit 1
Regression analysis with interest rates as the independent variable

Covariance between interest rates and bond yields	**0.000586**
Variance of interest rates	0.000956
Variance of bond yields	0.000765
Average short-term interest rate	5.50%
Average bond yield	6.78%

After estimating the regression equation, Diaz tested the slope coefficient for significance. Although he knew the method of testing, he did not know how changes in the values of key inputs affected the ultimate conclusion. When he asked Thomas about it, he made the following comments:

Statement 5: "If you decrease the level of significance from 5% to 1%, the probability of Type 1 error will decrease and the probability of Type 2 error will increase."

Statement 6: "Smaller standard errors lead to tighter confidence intervals but if the standard error is incorrectly calculated the probability of Type 1 error will increase."

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

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

Correct Answer: C

Reference:
Level II of CFA® Program Volume 1, Study Session 3, Reading 7, LOS a

Statement 1 is incorrect. Coefficients can be computed validly if the *means*, variances of the two variables, and the covariance between them are finite and constant.

Statement 2 is incorrect. For the correlation coefficient to be -1, it is not necessary that if one variable increases by one unit, the other has to decrease by one unit. Only the slope has to be constant.

8. With respect to statement 3, is Thomas *most likely* correct?

    A. No.
    B. Yes, because the presence of outliers distorts results.
    C. Yes, because the presence of outliers invalidates the normal distribution assumption.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 1, Study Session 3, Reading 7, LOS b

Thomas is incorrect. Outliers may provide important information about market reactions during a particular time period. Therefore, the correlation that includes the outliers may make more sense than the correlation that excludes them. One should first determine whether the outliers contain important information, and then use judgment to determine whether to include or exclude them.

9. With respect to Statement 4, Thomas's conclusion is *most likely*:

    A. correct.
    B. incorrect, because the relationship is spurious.
    C. incorrect, because the result is a data mining error.

    Correct Answer: B

    Reference:
    Level II of CFA® Program Volume 1, Study Session 3, Reading 7, LOS b

    Thomas has found a correlation between risk and return arising not from a direct relation between them but from their relation to a third variable (initial investment). This is an example of a spurious correlation.

10. With respect to his conclusion about the correlation between short-term interest rates and bond yields, Thomas is *most likely* using a:

    A. smaller sample size than Diaz.
    B. one-tailed test of significance.
    C. lower standard error in his calculations.

    Correct Answer: A

    Reference:
    Level II of CFA® Program Volume 1, Study Session 3, Reading 7, LOS c

    Even though the correlation is large and positive, the fact that Thomas rejected the significance of the coefficient means that he might be using a smaller sample size than Diaz. A small sample will decrease the value of the test statistic and will increase the probability of not rejecting the null hypothesis.

11. Using the information provided in Exhibit 1, the values of the intercept and slope coefficients are *closest* to:

    A. 0.03 and 0.61 respectively.
    B. 0.03 and 0.69 respectively.
    C. 0.02 and 0.80 respectively.

    Correct Answer: A

Reference:
Level II of CFA® Program Volume 1, Study Session 3, Reading 7, LOS e

Slope coefficient: $0.000586/0.000956 = 0.613$
Intercept: $\bar{Y} - (Slope \times \bar{X}) = 0.0678 - 0.613(0.0550) = 0.0341$

12. Thomas is *least* accurate with respect to:

   A. Statement 5 only.
   B. Statement 6 only.
   C. neither Statement 5 nor Statement 6.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 1, Study Session 3, Reading 7, LOS i

Statement 5 is correct. Decreasing the level of significance decreases the probability of Type 1 error, but increases the probability of Type 2 error failing to reject the null hypothesis when, in fact, it is false.

Statement 6 is correct. Small standard errors (SE) lead to tighter confidence intervals, but if the SE is incorrectly calculated, the errors will inflate the t-statistic and increase the probability of Type 1 error.

Questions 13 through 18 relate to Economics

Angel Associates (ANA) Case Scenario

Cynthia Angel is the head of the portfolio management team at the institutional wing of Angel Associates (ANA), an investment firm in Alabama, USA. Angel is currently managing the All Equity Fund (AEF) of the firm, a fund that invests in a diverse set of domestic and international equities. Since the AEF invests internationally, Robert Kelly, a currency overlay manager, has been hired to manage the currency component of each equity investment. Presently, Kelly is determining the rate at which he would be able to convert EUR5 million to Canadian dollars. He has gathered the following information about spot rate quotes in the interbank market.

Exhibit 1
Spot Rate Quotes

CAD/USD	**1.0133/1.0138**
EUR/USD	0.7894/0.7899
USD/JPY	0.01257/0.01260

The All Equity Fund has invested 5% of its total worth in a diversified fund of Australian equities. To hedge the risk of a depreciation of the Australian dollar against the USD, Kelly is planning to sell AUD in the forward market. He has gathered the following information for this purpose.

Exhibit 2

Spot USD/AUD	**1.0215**
180-day LIBOR(AUD)	5.01%
180-day LIBOR(USD)	2.56%

In the past, AEF hedged a long exposure to British Pound, worth GBP5 million, at a time when the all-in forward price was 1.0122 USD/GBP. Six months prior to the settlement date, Kelly wants to mark this forward position to market. Exhibit 3 displays the spot and forward rate quotes in the FX market.

Exhibit 3
Spot and Forward Quotes (Bid-Offer)

Spot rate (USD/GBP)	1.0139/1.0140
Six month points	–15.4/–11.2
Three month points	–12.1/–9.8
Three month LIBOR (USD)	1.13%
Six month LIBOR (USD)	3.14%
Six month LIBOR (GBP)	4.15%

13. The bid-offer rate on the CAD/JPY cross rate implied by the interbank market is *closest* to:

    A. 0.01274/0.01276.
    B. 0.01240/0.01243.
    C. 0.01274/0.01277.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 1, Study Session 4, Reading 11, LOS a

Cross rate CAD/JPY = (CAD/USD)×(USD/JPY)
Bid: 1.0133×0.01257= 0.01274
Offer: 1.0138×0.01260= 0.01277

14. If a dealer quoted a bid-offer rate of 0.7780/0.7781 EUR/CAD, then a triangular arbitrage would *most likely* involve:

    A. buying CAD from the dealer and selling CAD in the interbank market.
    B. selling CAD to the dealer and buying CAD in the interbank market.
    C. buying EUR from the dealer and selling CAD in the interbank market.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 1, Study Session 4, Reading 11, LOS b

The interbank implied cross rate for EUR/CAD = EUR/USD (CAD/USD)$^{-1}$
Bid: 0.7894 (1/1.0138) = 0.7894 × 0.9864 = 0.7787
Offer: 0.7899 (1/1.0133) = 0.7899 × 0.9869 = 0.7796

Hence, the dealer is posting an offer rate to sell the CAD too cheaply. Hence, triangular arbitrage would involve buying CAD from the dealer (paying the dealer's offer) and selling CAD in the interbank market at the bid for a profit of EUR 0.7787– 0.7781 = 0.0006per CAD

15. The forward premium (discount) for a 180-day forward contract for USD/AUD is *closest* to:

    A. -0.01236
    B. -0.01220.
    C. 1.009

Correct Answer: B

Reference:
Level II of CFA® Program Volume 1, Study Session 4, Reading 11, LOS c

1.0215[(180/360)/(1+0.0501(180/360))](0.0256 – 0.0501)= –0.01220

16. If Kelly wants to sell the U.S. dollar three months forward against the GBP using an FX swap, rather than the stated six months, the all-in rate that he will use will be *closest* to:

    A. 1.01274.
    B. 1.01297.
    C. 1.01302.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 1, Study Session 4, Reading 11, LOS d

Selling U.S. dollar is equivalent to buying GBP (the base currency). Hence, the *offer* side of the market will be used for forward points and the mid-market on the spot quote will be used (because this is an FX swap).
i.e.(1.0139+1.0140)/2=1.01395. The all-in forward price is: 1.01395+(–9.8/10,000) = 1.01297

17. The mark-to-market for AEF's forward position used to hedge exposure to the GBP is *closest* to:

    A. –$3,347.
    B. –$3,400.
    C. –$4,100.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 1, Study Session 4, Reading 11, LOS d

To hedge the long exposure, AEF must have sold GBP5 million at an all-in price of 1.0122 USD/GBP. To offset, it would need to buy GBP5 million six months forward to the settlement date. The GBP amounts would net to zero. Because AEF is buying the base currency, it would pay the offer for both the spot and forward points. The all-in six month forward rate will be: 1.0140 – 0.00112 = 1.01288.

On settlement day, AEF will receive GBP5 million ×1.0122 = $5,061,000 from the original forward contract and will pay out GBP5 million × 1.01288 = $5,064,400 based on the offsetting contract. The net cash flow on settlement day is –$3,400. The present value is: –3,400/{1+0.0314(180/360)} = –$3,347.445

18. Assuming everything else remains constant, if instead of the GBP, AEF hedged a long exposure to the USD worth 5 million, the mark-to-market for AEF's USD forward position would be *closest* to GBP:

    A. 749.60.
    B. 764.84.
    C. 1,003.80.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 1, Study Session 4, Reading 11, LOS d

To hedge a long exposure to the USD, AEF would have sold USD5 million forward. It would have to buy USD to close out the position, which is equivalent to selling GBP. Selling the GBP means calculating the *bid* rate: $1.0139 + (-15.4/10,000) = 1.01236$

On the original contract, AEF will receive: $5,000,000/1.0122 = $ GBP 4,939,735.23. In the offsetting contract, AEF will have to pay: $5,000,000/1.01236 = $ GBP 4,938,954.522

The difference is a cash inflow of GBP 780.708. The present value: $780.708/\{1+0.0415\times(180/360)\} = $ GBP 764.84

Questions 19 through 24 relate to Corporate Finance.

General Capital Management (GCM) Case Scenario

General Capital Management (GCM) is an investment advisory firm. Bob Morgan has just joined GCM as the head of its corporate finance wing. Synergy Chemicals (SYNC) is one of the firm's oldest corporate clients, and Morgan has been assigned as its financial consultant. Bryan Grant, the chief executive officer (CEO) at SYNC, invited Morgan over to discuss the optimal capital structure for SYNC. He posed the following questions during the meeting:

Question 1: "Currently, SYNC is an all equity firm with a cost of equity of 12.45%. If we decide to change our debt/equity ratio to 0.5, how will this affect our cost of equity?"

Question 2: "If we issue debt, such that long-term debt is 30% of our company's current value, how will this affect our firm's weighted average cost of capital?"

Question 3: "If we issue debt, such that long-term debt is 30% of our company's new market value, how will this affect our firm's weighted average cost of capital?"

Question 4: "The financial department at SYNC has indicated that our cost of equity will rise with increased levels of debt from 12.45% (no debt) to 15% (40% debt) to 18% (70% debt). In addition, the marginal cost of borrowing is expected to be 13.5% on 40% debt and 19% on 70% debt. How can this information help us in deciding SYNC's target capital structure?"

Question 5: "SYNC has paid an annual dividend of $3.5/share for the past three years with an average dividend payout ratio of 55%. During the same period, excavation costs were quite volatile, which, along with changing labor laws, have caused a considerable variability in SYNC's costs. However, capital budgeting has revealed $6 million in positive NPV projects for SYNC for the current year. If we do not wish to issue debt, what dividend per share should SYNC issue currently on its 5 million shares outstanding?"

To answer Grant's questions accurately, Morgan has gathered the following information.

<div align="center">

Exhibit 1

Earnings before taxes	**$345 million**
Tax rate	35%
Interest rate on long-term debt	10%

</div>

After the meeting, Grant told Morgan that SYNC is planning to repurchase $1 million shares with the objective of increasing earnings per share. In addition, the company plans to initiate a 3% annual stock dividend. He stated that both these changes are likely to increase shareholder wealth.

---

19. Using the information in Exhibit 1, according to MM Proposition 2 without taxes, what is the best response to Grant's first question? The cost of equity will rise by:

    A. 0.796%
    B. 1.225%
    C. 13.675%

Correct Answer: B

Reference:
Level II of CFA® Program Volume 3, Study Session 7, Reading 21, LOS a

Current cost of equity: 12.45%.
Cost of equity: 0.1245 + (0.1245 – 0.10)×0.5= 13.675%

20. Using the information provided in Exhibit 1, under MM Proposition 2 with taxes, Morgan's response to Question 2 should be that the weighted average cost of capital will be *closest* to:

    A. 11.27%.
    B. 11.73%.
    C. 12.01%.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 3, Study Session 7, Reading 21, LOS a

V_u= {345×(1–0.35)}/0.1245 = $1,801.2048 million
V_L= 1,801.2048 + (0.35×540.361) = $1,990.3313---debt is 30% of 1,801.2048

Value of equity after issuance of debt: 1990.3313 –540.361 = $1,449.9703
Cost of equity: 0.1245+{(0.1245–0.10)×(1–0.35)×(540.361/1,449.9703)} = 13.043%
WACC: {(540.361/1,990.3313)×(0.10)×(1–0.35)} + {(1,449.9703/1,990.3313)×(0.13043)} = 11.267%

21. Using the information provided in Exhibit 1, under MM Proposition 2 with taxes, Morgan's response to Question 3 should be that the weighted average cost of capital will be *closest* to:

   A. 6.5%
   B. 11.14%
   C. 11.7%

Correct Answer: B

Reference:
Level II of CFA® Program Volume 3, Study Session 7, Reading 21, LOS a

Cost of Equity: 0.1245 + [(0.1245-0.10)(1-0.35)]30/70 = 0.1313
WACC: {(0.3)×(0.10)×(1–0.35)} + {(0.7)×(0.1313)} = 0.11715=11.14%

22. Using the information provided by Grant in Question 4, the cost-minimizing capital structure for SYNC is *most likely*:

   A. all equity.
   B. 40% debt.
   C. 70% debt.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 3, Study Session 7, Reading 21, LOS b

WACC with no debt: 12.45%
WACC with 40% debt: {0.40×(0.135)×(1 – 0.35)} + {0.60×(0.15)} = 12.51%
WACC with 70% debt: {0.70×(0.19)×(1 – 0.35)} + {0.30×(0.18)} = 14.045%

Since WACC is lowest when SYNC has no debt in its capital structure, this is the cost-minimizing capital structure.

23. Using the information provided in Question 5, if SYNC's earnings are anticipated to be $34 million, the target payout ratio is 0.55,the adjustment factor is 1, and if SYNC follows a residual dividend payout policy, its annual dividend per share will *most likely* be:

    A. $0.54/share greater than the dividend under a target payout ratio policy.
    B. $1.858/share greater than the dividend under a target payout ratio policy.
    C. $1.20/share greater than the dividend under a target payout ratio policy.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 3, Study Session 7, Reading 22, LOS f

Dividend under residual dividend policy: $34-6(1)/5 million shares: $5.6/share

Dividend under target payout ratio policy:
•Last-year EPS = dividend / payout ratio = 3.5 / 55% = 6.36
•Last-year Total earnings = 6.36 × 5 million = 31.8182
• Anticipated earnings = 34 million or EPS = $34m/5m = $6.8

Expected Dividend per share under target payout ratio = Last dividend per share + (Expected increase in EPS × target payout ratio × adjustment factor)
= $3.5 + [($6.8 – $6.36) × 0.55 × 1.0]
= $3.742 ➔ $1.858 less than that of residual dividend policy (i.e. $5.60 – $3.742 = $1.858)

24. Are SYNC plans to increase shareholder wealth *most likely* correct?

    A. No.
    B. Only with respect to share repurchases.
    C. Only with respect to stock dividends.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 3, Study Session 7, Reading 22, LOS g

Share repurchases do increase EPS, but changing EPS by changing the number of shares outstanding does not affect shareholder wealth, if total free cash flow is unchanged. Also, a stock dividend has no effect on shareholder wealth. A shareholder owns the same percentage of the company and its earnings as it did before the stock dividend.

Questions 25 through 30 relate to Financial Reporting and Analysis.

Lucid Enterprises (LUCEN) Case Scenario

Justin Ritter, a chartered financial analyst, works at an equity investment management firm in Minnesota, USA. Ritter is currently analyzing the defined benefit pension plan offered by Lucid Enterprises (LUCEN) to its employees. LUCEN promises to pay its employees pension benefits over a period of 20 years after retirement, with the benefit calculation based on the employee's final year salary. LUCEN prepares its financial statements in accordance with the IFRS. Exhibits 1 and 2 display some information that Ritter has gathered on LUCEN's retirement plans.

Exhibit 1
LUCEN Retirement Plan Information for the year 2015 (in millions)

Current service costs	**$250**
Past service costs	$150
Plan assets at beginning of year	$45,000
Plan assets at end of year	$47,000
Benefits paid	($2,000)
Employer contributions	$1,000
Actuarial gain/(loss) – PBO related	($700)
Benefit obligation at beginning of year	$48,000

LUCEN used a discount rate of 6.5% to estimate plan liabilities. In addition, the expected rate of return on plan assets for the year 2015 was 7.0%.

During the evaluation process, Litter determined, that as part of their pension planning, the pension committee at LUCEN often revised the estimates and assumptions needed to calculate the amount of pension liability. Exhibit 2 displays revisions in key assumptions.

Exhibit 2
Revised Estimates Used for LUCEN's DB Plan

Assumptions	2016	2015
Expected rate of return on plan assets	7.45%	7.00%
Discount rate	6.32%	6.5%
Life expectancy of beneficiaries	25 years after retirement	20 years after retirement
Rate of compensation increase	3% per annum	3.5% per annum

25. The actual return on plan assets of LUCEN during the year 2015 was *closest* to:

 A. $1,000 million.
 B. $2,000 million.
 C. $3,000 million.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 3, Study Session 5, Reading 15, LOS b

Actual return on plan assets:
Fair value of plan assets (end) – employer contributions + benefits paid – Fair value of plan assets (beg)
= 47,000 – 1,000+2,000 – 45,000
= $3,000 million.

26. Assuming that the company's actual returns on plan assets equal $3,000 million, the amount of periodic pension cost that would be reported in P&L and the cost/loss that would be reported in other comprehensive income in the year 2015 will be *closest* to:

 A. $445 million and $1,625 million respectively.
 B. $595 million and $625 million respectively.
 C. $610 million and $2,850 million respectively.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 3, Study Session 5, Reading 15, LOS c

Under IFRS, the components of periodic pension cost that would be reported in P&L are the service cost and the net interest expense or income. Here this equals:

Service costs +net interest expense = (250+150) + [(48,000 – 45,000) × 6.5%]
= 400+195 = $595 million.

The third component representing 're-measurement' will be reported in OCI. Here it equals:

Re-measurement component =
Actuarial Gain/(loss) on PBO + (Actual return less interest on Plan Assets)
= (Actuarial loss) + [Actual return – (Beginning plan assets × Discount rate)]
= ($700) + [$3000 – ($45000 × 6.5%)]
= ($625) million

27. Assuming LUCEN does not immediately recognize the actuarial loss, there is no amortization of past service costs or actuarial gains and losses, and if instead of the IFRS, financial statements are reported in accordance with the U.S. GAAP, the amount of periodic pension cost that would be reported in the P&L would be *closest* to:

    A. $220 million.
    B. $460 million.
    C. $1,370 million.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 15, LOS c

Ignoring past service costs and actuarial gains and losses, the amount reported in P&L under U.S. GAAP will equal:
Current service cost + interest expense –expected return on plan assets
= 250 + (48,000 × 6.5%) – (45,000 × 7.0%)
= $220 million

28. The benefit obligation at the end of the year 2015 reported by LUCEN will be *closest* to:

    A. $49,220 million.
    B. $50,220 million.
    C. $50,460 million.

Correct Answer: B

Reference:
Level II of CFA® Program Volume2, Study Session 5, Reading 15, LOS b & c

Benefit obligation at the end of the year will equal:

Benefit obligation at beg of year +service cost + interest cost + benefits paid + actuarial loss
= 48,000+250+150+(48,000 × 6.5%) – 2,000 + 700 = $50,220 million

29. Under U.S. GAAP and ignoring past service costs and amortization of actuarial gains and losses, if Ritter makes adjustments to the income statement to truly reflect LUCEN's operating performance, the:

    A. net operating expenses will increase by $30 million, interest expense will increase by $3,120 million, and investment income will increase by $3,150 million.
    B. net operating expenses will increase by $30 million, interest expense will increase by $3,120 million, and investment income will increase by $3,000 million.
    C. net operating expenses will decrease by $3,120, interest expense will increase by $3,120, and investment income will increase by $2,000 million.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 15, LOS e

Under U.S. GAAP service costs, interest costs and the expected return on plan assets will be reported in net operating expenses. Excluding the total and adding only current service costs will be the appropriate adjustment. The interest cost will be added to interest expense. The actual return on plan assets will be added to investment income.

Current service costs = $250 million
Interest expense = $48,000 × 0.065 = $3,120 million
Expected return on plan assets = $45,000 × 0.07 = $3,150 million

Periodic pension cost reported under US GAAP = $250 + $3,120 – $3,150 = $220 million

The following adjustments will be made:

Operating expenses – $220 million + $250 million= OE +$30 million.
Interest expense will increase by 48,000 × 6.5% = $3,120 million.
Investment income will increase by the actual return to plan assets i.e. by $3,000 million*.

*Actual return on plan assets:
Fair value of plan assets (end) – employer contributions + benefits paid – Fair value of plan assets (beg)
= 47,000 – 1,000+2,000 – 45,000
= $3,000 million.

30. Which of the following about the effect of the changes in assumptions on LUCEN's financial statements is *most* accurate?

    A. The change in the expected rate of return on plan assets will improve the funded status reported on the balance sheet, but will have no effect on the periodic cost reported in the P&L
    B. If LUCEN does not revise its estimate of the discount rate, its reported liabilities will be lower and its reported net income will be higher
    C. The change in the life expectancy estimate will increase total liabilities and will result in a higher reported periodic pension cost

Correct Answer: B

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 15, LOS d

Option B is correct. A higher discount rate will result in a lower obligation, and a lower periodic cost (the pension plan is most likely of long duration), which in turn will result in a higher net income.

Option A is incorrect. A change in the expected return on plan assets will have no effect on the funded status because the fair value of plan assets is used on the balance sheet. Also, the expected return is not used in the calculation of periodic pension cost under IFRS.

Option C is incorrect. The change in life expectancy will have no effect on the pension liability since LUCEN promises to pay its employees a pension benefit over a fixed period of time (20 years).

Questions 31 through 36 relate to Financial Reporting and Analysis

Julie McDonald Case Scenario

Julie McDonald works as an investment manager at a capital management firm in New York, USA. McDonald is head portfolio manager for the Equix Fund, a fund that invests in equities of large market capitalization firms. One of the firms that McDonald is evaluating for investment is BlueShot Products Incorporated (BLUSH). BLUSH is a U.S.-based multinational firm with a wholly-owned Canadian subsidiary, BluCan. BlueCan was incorporated on January 01, 2016 and is an independent entity making autonomous decisions about operations, investing and financing. For her analysis, McDonald gathered BluCan's financial statements presented in Canadian dollars in addition to the relevant USD/CAD exchange rates. Exhibits 1 and 2 display this information. During the period under analysis, Canada experienced mild inflation.

Exhibit 1
Assets, Liabilities and Net Income of BluCan
as of 2016 (in CAD millions)

Cash	**95**
Accounts receivable	156
Inventory measured at market value	250
Inventory measured at cost	300
Property plant and equipment	2130
Accumulated depreciation	312
Accounts payable	220
Long-term notes payable	575
Capital stock – All issued at start of the year	1,209
Net Income	650

*BluCan declared dividends of 35 million in 2016

Exhibit 2
Applicable Exchange Rates (USD/CAD)

31 December 2015	**1.023**
Average rate in 2016	1.078
31 December 2016	1.119
15 November when dividends were declared	1.101
Weighted average rate when inventory was acquired	1.066

After her evaluation, McDonald met with David Bartel, a financial analyst at the firm. During their discussion, McDonald stated that a subsidiary's inventory accounting method can have a considerable effect on the consolidated financial statements of the parent. Bartel stated that the choice of the subsidiary's functional currency can affect several of the parent company's financial ratios.

---

31. In year 2016, BLUSH's consolidated financial statements will *most likely* include a translation gain/loss *closest* to:

   A. $26 million as part of net income.
   B. $115 million as part of a separate component of equity.
   C. $142 million as part of a separate component of equity.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 16, LOS e

Since BluCan is an autonomous body the CAD is most likely its functional currency. Hence, the current rate method will be used to translate its financial statements to U.S. dollars. Translating the income statement (in millions):

	CAD	Exchange rate	USD
Net Income	650	1.078	700.70
Less: Dividends	(35)	1.101	38.535
Retained earnings	615		662.165

Translating the balance sheet (in millions):

	CAD	(USD/CAD)	USD
Total Assets	2,619	1.119	2,930.661
Total liabilities	795	1.119	889.605
Capital Stock	1,209	1.023	1,236.807
Retained earnings	615	From I/S	662.165
Translation Adjustment		To balance	142.084
Total			2,930.661

32. Assuming BluCan's translated income before translation gain/loss is $850.64 million, if the U.S. dollar were chosen as the functional currency for BluCan in 2016, the translation gain/(loss) included in BLUSH's consolidated financial statements will be *closest* to:

    A. ($188.47) million and will be reported in the income statement(I/S).
    B. ($237) million and will be accumulated as a separate component of equity.
    C. ($198.28) million and will be reported in the I/S.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 16, LOS e

In this case, the temporal method will be used for translating BluCan's financial statements.

	CAD	Exchange rate	USD
Cash	95	1.119	106.305
Accounts receivable	156	1.119	174.564
Inventory measured at lower of cost or market value	250	1.119	279.750
Inventory measured at cost	300	1.066	319.800
Property plant and equipment	2130	1.023	2,178.99
Less: Accumulated depreciation	(312)	1.023	(319.176)
Total Assets			2,740.233
Accounts payable	220	1.119	246.180
Long-term notes payable	575	1.119	643.425
Capital stock	1,209	1.023	1,236.807
Retained earnings	615	To balance	613.821

Translating the income statement:

	CAD	Exchange rate	US.D
Income before trans. Gain/loss			850.64
Translation gain/loss		to balance	(198.284)
Net Income			652.356
Less: Dividends	35	1.101	38.535
Retained earnings		From B/S	613.821

33. Under the temporal method, if BluCan had marketable debt securities as part of its total assets, and accrued expenses and deferred income taxes as part of its total liabilities, which of the following exchange rate(s) will it use to translate them into U.S. dollars?

    A. $1.119/CAD only
    B. $1.119/CAD and $1.03/CAD
    C. $1.078/CAD and $1.119/CAD only

Correct Answer: A

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 16, LOS d

Marketable debt securities are monetary assets; accrued expenses and deferred income taxes are monetary liabilities. Hence, only the current rate will be used to translate these under the temporal method.

34. If BLUSH wants to report a higher fixed asset turnover in its consolidated financial statements at a time when the Canadian dollar is weakening against the U.S. dollar, BluCan should *most likely*:

    A. choose the Canadian dollar as its functional currency, but this will also result in a higher debt to assets ratio.
    B. choose the U.S. dollar as its functional currency, but this will also result in a lower debt to equity ratio.
    C. increase the amount of accrued expenses and deferred income taxes reported on its balance sheet.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 16, LOS f

If the CAD is weakening against the USD, the current rate method will result in lower fixed assets. This will result in a higher fixed asset turnover (since sales are the same under both methods). The current rate method will be used if the CAD is chosen as the functional currency for BluCan. However, this method will result in a higher debt to assets ratio; total debt will be the same under both methods but total assets will be lower under the current rate method.

35. If the USD were chosen as the functional currency for BluCan, which of the following will result in the *highest* consolidated inventory turnover? (inventory was purchased at the same CAD price throughout the year)

    A. LIFO inventory accounting and a depreciating Canadian dollar
    B. FIFO inventory accounting and a depreciating Canadian dollar
    C. FIFO inventory accounting and an appreciating Canadian dollar

Correct Answer: B

Reference:
Level II of CFA® Program Volume 2, Study Session 5, Reading 16, LOS f

In FIFO inventory accounting method, the items remaining in ending inventory will be the ones that were acquired most recently. Hence, under the temporal method (USD as the functional currency) they will be translated at the most recent rate. A depreciating CAD will result in lower USD inventory; it will also result in higher COGS (which will be translated at the higher historical rate). Hence, this will increase the inv. turnover (COGS/Inv).

36. If Canada was considered a highly inflationary country, which of the following conditions would result in the same translation results under both IAS 21 and SFAS 52 in the consolidated financial statements?

    A. The U.S. and Canadian dollar exchange rate changes by exactly the same percentage amount as the change in the general price index in Canada
    B. The U.S. and Canadian dollar exchange rate changes by exactly the same percentage amount as the change in the general price index in the U.S.
    C. The percentage appreciation of the U.S. dollar against the Canadian dollar is exactly equal to the inflation differential between the two countries

Correct Answer: A

Reference:
Level II of CFA® Program Volume 2, Study Session 6, Reading 19, LOS g

If the exchange rate between two currencies changes by exactly the same percentage amount as the change in the general price index in the highly inflationary country, then the two methodologies produce the same results.

Questions 37 through 42 relate to Equity Investments

Parachute Investments (PARIN) Case Scenario

Alex Forman is an equity analyst working for Parachute Investments (PARIN), an equity management firm offering investment advisory and management services to institutional as well as private wealth clients. Forman works with Cindy Pon to manage GLOMES fund, an equity fund that invests in domestic as well as global equities. Presently, Forman has asked Pon to use the internal rate of return (IRR) concept to determine a required return estimate for the stock of Vivo Products Inc. (VIVO), a firm operating in the utilities industry. For this purpose, Pon determined that the forecasted dividend for next year is $5.06/share, the current long-term dividend growth rate equals 3.95% and the expected dividend growth rate equals 3.28%. The stock's current market price is $67.29. She then made the following comments to Forman:

Statement 1: "I have used the above information to determine a required return estimate of 10.80% for VIVO's stock. However, my calculation model does not explicitly include an adjustment for risk and the estimate holds true only if the market is efficient."

Statement 2: "My method of determining the required return is very similar to the exercise of inferring what the market implies about future growth rates of cash flows, given an independent estimate of required return."

As their discussion about return estimates continued, Forman stated that an accurate equity risk premium estimate played an essential role in increasing the accuracy of the required return estimate. When Pon asked about whether to use the geometric or arithmetic mean in calculating the risk premium, Forman stated that the major finance models were single period models, so the arithmetic mean was a model-consistent choice. However, he added that compounding forward using the sample arithmetic mean, even when returns are serially uncorrelated, overestimated the expected terminal value of wealth. Pon disagreed, and stated that the geometric mean is the logical choice for estimating a required return in a multi-period context, even when using a single-period required return model. She also stated that risk premium estimates based on the geometric mean have tended to be closer to supply-side and demand –side estimates from economic theory than arithmetic mean estimates.

After their meeting, Forman proceeded with estimating the equity risk premium for U.S. equities using information about a broad-based equity market index. Exhibit 1 displays some data he accumulated for this purpose.

Exhibit 1
Data for U.S. Equity Markets

YTM of 20-year maturity T-bonds	**5.6%**
YTM of 20-year maturity TIPS	3.01%
Labor productivity growth	1.1%
Population growth rate	1.13%
Increase in labor force participation rate	2.01%
Expected dividend yield	3.5%
Reinvestment return	40 bps
Current long-term corporate bond yield	7.5%

*The U.S. risk-free rate is 4.5%

In addition, Forman expects the corporate earnings to grow at a rate faster than the growth rate of the overall economy. His estimate of this surplus growth is 1.5%. He also believes that the current P/E level reflects overvaluation of equities and should be adjusted by 2.5%.

Pon is also trying to estimate an appropriate equity risk premium. However, she believes that markets are moving towards perfect integration and that the beta of U.S. stocks relative to the MSCI World Index is 0.9265. She has also estimated the national and global risk-free rates to equal 4.3% and 5.7% respectively. She wonders how her belief will affect her estimate of equity risk premium relative to what Forman just estimated.

After estimating the equity risk premium, Forman is now estimating the beta for Ellen Designs (ELLED), a privately owned clothing outlet. Forman decides to use the beta of a public comparable to estimate the beta of ELLED. He determines the public peer's beta to be 1.31. When Pon asked Forman about the procedure involved, Forman made the following comments:

Statement 3: "If the public peer has 20% more debt than ELLED, its equity beta will be 20% greater than the estimated beta for ELLED."

Statement 4: "If ELLED has exactly the same amount of debt in its capital structure as its public peer, its estimated beta will be close to the equity beta of the public peer."

As the last assignment of the day, Pon has to estimate the required return of a private business. For this, she first estimates an equity risk premium with reference to the S&P 500 index. She then adds the risk-free rate and a beta-adjusted size premium to this estimate, with the size premium estimate based on the lowest market-cap decile.

---

37. Pon is *most* accurate with respect to:

   A. Statement 1 only.
   B. Statement 2 only.
   C. both statements 1 and 2.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 4, Study Session 9, Reading 27, LOS a

Statement 1 is correct. The required return estimate equals 10.80% =(5.06/67.29)+(3.28%) when the IRR is used as a required return estimate. Such a calculation assumes market efficiency (market price = intrinsic value). Also, the asset's risk, although incorporated indirectly into the required return estimate via the market price, is not explicitly incorporated as it is in many competing models.

Statement 2 is incorrect. Obtaining an IRR from a present value model (as above) is not the same as determining the implied future growth rates of cash flows (as implied by the market price). The latter has the purpose of assessing the reasonableness of the *market price,* whereas the former assumes that market price *is* efficient.

38. With respect to their comments about the equity risk premium estimates based on the geometric and arithmetic mean, are Forman and Pon *most likely* correct?

    A. Only Forman is correct
    B. Only Pon is correct
    C. Both Forman and Pon are correct

Correct Answer: C

Reference:
Level II of CFA® Program Volume 4, Study Session 9, Reading 27, LOS a

Forman is correct. The arithmetic return best represents the mean return in a single period, so, with its focus on single-period returns, appears to a model-consistent choice when using single-period models. Also, it has been established that compounding forward using the *sample* arithmetic mean, whether or not returns are serially uncorrelated, overestimates the expected terminal value of wealth.

Pon is correct. The geometric mean is a compound growth rate; hence, it appears to be a logical choice for estimating a required return in a *multi-period* context, even when using a single-period required return model. Also, risk premium estimates based on the geometric mean have tended to be closer to supply-side and demand –side estimates from economic theory than arithmetic mean estimates.

39. Using the information gathered by Forman, an estimate of the U.S. equity risk premium is *closest* to:

    A. 4.69%.
    B. 5.09%.
    C. 5.24%.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 4, Study Session 9, Reading 27, LOS b

Expected Inflation: (1.056/1.0301) – 1 = 2.514%
Expected growth in real earnings per share: 1.1%+1.13%+2.01% = 4.24%
Adjustment for excess corporate growth: 4.24%+1.5% = 5.74%
Expected income component: 3.5%+0.40% = 3.9%
EGPE = –2.5% (since currently, equities are overvalued)

Equity risk premium:
[(1.02514)×(1.0574)×(0.975)–1 + 0.039] –0.045 = 5.09%

40. Assuming that the U.S. equity risk premium is 4.75%, Pon will *most likely* use a:

    A. 5.127% equity risk premium estimate and a 4.3% risk-free rate to obtain the required return estimate.
    B. 5.322% equity risk premium estimate and a 5.7% risk-free rate to obtain the required return estimate.
    C. 5.099% equity risk premium estimate and a 4.3% risk-free rate to obtain the required return estimate.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 4, Study Session 9, Reading 27, LOS c

The assumption that markets are perfectly integrated results in the use of the international CAPM to estimate the required return. In this, the risk premium is relative to a world market portfolio. The world equity risk premium will equal 4.75%/0.9265 = 5.127%. Pon will use the national risk-free rate of 4.3% in the international CAPM equation to estimate the required return.

41. Forman is *least* accurate with respect to:

    A. Statement 3 only.
    B. Statement 4 only.
    C. both statements 3 and 4.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 4, Study Session 9, Reading 27, LOS d

Statement 3 is incorrect. Assuming that a higher debt level for the public company relative to ELLED (by 20%) will translate into a higher beta for the former by the same proportion (20%) is not true.

Statement 4 is incorrect. If ELLED has the same *level of leverage* in its capital structure as its public peer, then re-leveraging will result in the same beta as before. Same amount of debt as peer does not indicate that the firms' estimated beta will be close to the equity beta of the peer.

42. Pon's estimate of required return (as part of his last assignment) *most likely* corresponds to the return on a(n):

   A. average-systematic-risk micro-cap public equity issue.
   B. below-average risk micro-cap public equity issue.
   C. above-average-systematic risk micro cap private equity issue.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 5, Study Session 10, Reading 29, LOS e

Pon implicitly multiplies the equity risk premium with a 1.0 beta (average risk). He then adds a small size premium to the estimate (which is based on large-cap stocks included in the S&P 500 index). The result thus corresponds to an average systematic risk micro-cap (since the size premium is based on the lowest decile) public equity issue.

Questions 43 through 48 relate to Equity Investments

James Blackwell Case Scenario

James Blackwell is an investment analyst at Thornton Securities. Blackwell has been tasked with evaluating the stock of Gratin, a Vietnamese based manufacturer and exporter of frozen food products such as vegetables and meat, for investment.
The frozen food industry is a global industry. Blackwell begins his analysis by conducting a Porter's analysis on the industry summarizing the information in Exhibit 1. He also expresses his concerns regarding the rising inflation in global input prices and forecasts this trend to continue for the next fifteen months. His analysis of the industry and Gratin will be based on the inflation projection.

Exhibit 1

Threat of substitutes	Low because Gratin's food products have the longest shelf life
Intensity of rivalry	Low because Gratin dominates the global industry. There are only three foreign competitors with market shares of 10% each.
Bargaining power of suppliers	Low because Gratin has access to a large number of cattle ranchers and agriculture producers in Vietnam. Gratin has now started to rely on its own farm to acquire a portion of the necessary input for production. The company plans to expand its farms to fully meet output demand in the near future.
Bargaining power of customers	Low as the customer base is fragmented including a variety of retail supermarket chains
Threat of new entrants	Low because of recent specialized frozen technology adopted by industry participants and high leverage structures making it difficult for new players to enter the industry

Next, Blackwell studies the impact of inflation on Gratin's 2016 sales volume. He designs three alternative scenarios each of which predicts how the company will react to inflationary pressure. Exhibit 2 shows Gratin's financial results for the most recent financial year (2015) while Exhibit 3 show the estimates of input prices, volume growth and pricing under the three scenarios.

Exhibit 2

Sales	550,420
Cost of goods sold	388,940
Gross profit	161,480
Gross profit margin	29.34%

*All non-percentage figures are denominated in the local currency, Vietnam dong (VDN).

Exhibit 3

	Scenario A	Scenario B	Scenario C
Price increases for revenues	0.0%	5.0%	10.0%
Volume growth	12.0%	8.0%	- 17.0%
Total revenue growth	12.0%	13.4%	- 8.7%
Input prices increase	10.0%	10.0%	10.0%

Blackwell would also like to estimate the impact on gross profit margin if Gratin is unable to pass on the 10% inflation in input costs to its customers. For his analysis, Blackwell relies on the data in Exhibit 2 and assumes the same financial results hold for 2016.

Blackwell concludes his analysis by comparing Gratin's operating performance and financial position to its competitors. He decides to rely on return on invested capital (ROIC) and forecasts that the measure will demonstrate a rising trend in the present inflation scenario based on past observations of how this measure reacted to inflation.

---

43. Based on the information presented in Exhibit 1, Blackwell can conclude that:

    A. the ability of Gratin to earn a high ROIC is low.
    B. Gratin is in a position to mitigate the impact of increased prices from some of suppliers.
    C. Gratin may not be in a position to easily pass price increases to customers.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 4, Study Session 10, Reading 28, LOS h & i

B is correct. The reason why Gratin will be in a position to mitigate the impact of increased prices from suppliers is because the company has access to inputs from alternative suppliers within the country. In addition, Gratin is focusing on becoming self-reliant which will remove the need to depend on third-party suppliers for input.

A is incorrect. With a low degree of industry rivalry, Gratin has a strong ability to earn a high ROIC. In addition, Gratin's competitive advantage (as exhibited by its 70% market share) relative to the three competitors will increase the manufacturer's potential to earn a high ROIC.

C is incorrect. Gratin's consumers have a low bargaining power, face high switching costs (as Gratin's products have the longest shelf life) and, are fragmented. All three factors will give Gratin pricing power over its consumers and will allow Gratin to pass price increases to its consumers with relative ease.

44. Based on the data in the Exhibit, Blackwell can conclude that Gratin's ability to:

    A. expand operations is unrestricted as Blackwell is the largest seller in the industry.
    B. demand lower input prices from suppliers is high.
    C. control prices charged to customers is low due to their fragmentation.

Correct Answer: B

Reference: Level II of CFA® Program Volume 4, Study Session 10, Reading 28, LOS h

B is correct. The bargaining power of Gratin's suppliers is clearly low and the company's decision to become self-reliant will further reduce the pricing power of its suppliers.

A is incorrect. Expanding operations is a function of demand. Even if a corporation owns major market share of a product, demand from customers is the primary driver for expansion of operations.

C is incorrect. Gratin's ability to control prices charged to its customers is high because the consumer base is fragmented and thus no individual consumer holds an influential bargaining position. Furthermore, high switching costs further decrease the bargaining power of consumers.

45. If Scenario C materializes, the change in gross profit margin from that reported in 2015 is *closest* to:

    A. – 50%
    B. – 23%
    C. 0%.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 4, Study Session 10, Reading 28, LOS i

C is correct. If Scenario C materializes, the resulting gross profit margin is 29.34% (see below). Therefore, the YOY change in the margin figure is 0%.

	YOY (%)	
Sales	$(1.10 \times 0.83) - 1$ = - 8.7%	VND 502,533
Cost of goods sold	$(0.83 \times 1.10) - 1$ = - 8.7%	VND 355,102
Gross profit		VND 147,431
Gross profit margin		29.34%

46. Considering the data in Exhibit 3, which of the following scenarios *most likely* assumes that the demand for Gratin's products is relatively price inelastic? Scenario:

    A. A.
    B. B.
    C. C.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 4, Study Session 10, Reading 28, LOS i

B is correct. When demand is price inelastic, revenues will benefit from inflation. In Scenario B, total revenue growth is + 13.4% compared to a + 12.0% growth observed in Scenario A in which price inflation is absent. Therefore, a price increase is seen to create revenue growth and it is in this scenario that the demand for Gratin's products is assumed to be relatively inelastic.

Scenario A does not assume any price inflation, therefore the impact of change in unit price on quantity demanded cannot be determined; while Scenario C assumes that demand is relatively price elastic as an increase in prices is seen to decrease revenue growth.

47. Using the data in Exhibit 2, if Gratin is unable to pass on the inflation to its customers, the resulting gross profit margin is equal to:

    A. 22.27%.
    B. 29.34%.
    C. 35.76%.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 4, Study Session 10, Reading 28, LOS i

A is correct. The gross profit margin which results if Gratin is unable to pass the 10% increase in input costs to its customers is calculated below:

Sales	VND 550,420
Cost of goods sold (1.1 × 388,940)	VND 427,834
Gross profit	VND 122,586
Gross profit margin	22.27%

48. Which of the following reasons *most likely* supports Blackwell's preference for the ROIC measure?

    A. The degree of competitive advantage secured by Gratin can be assessed.
    B. Gratin's degree of financial leverage can be compared to its competitors.
    C. The underlying profitability of companies following different tax regimes can be compared.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 4, Study Session 10, Reading 28, LOS f

A is correct. Sustainably high ROIC is a sign of competitive advantage and therefore, the degree of competitive advantage secured by Blackwell can be assessed using the measure.

B is incorrect. ROIC is not affected by a company's degree of financial leverage.

C is incorrect. ROCE is more useful in the peer comparison of companies in countries with different tax structures.

Questions 49 through 54 relate to Fixed Income.

Laura Peterson Case Scenario

Laura Peterson is the senior fixed income manager at Tuckhoe Limited, a portfolio management firm. She is attempting to explain to her subordinate, Clark Marshall, how the binomial model can be applied to the valuation of fixed-income securities. Peterson has drawn a list of objectives, which she intends to achieve during the discussion.

Objective 1: Value a 5% annual coupon-paying option-free bond using the binomial model.

Objective 2: Determine the impact of changing volatility on forward rates.

Objective 3: Determine what calibrating an interest rate tree implies for arbitrage profits.

Objective 4: Compare the valuation of a bond issue using spot rates to that performed with a binomial interest rate tree.

Objective 5: Explore Monte Carlo simulation, its statistical accuracy, and the implication of including mean reversion in model estimation.

To achieve the first objective, Peterson constructs a binomial interest rate tree using one-, two-, and three-year spot rates of 3%, 6%, and 8% respectively (Exhibit 1). A 10% volatility assumption is used for the analysis.

After deriving the binomial interest rate tree, Marshall asks his supervisor how the model can be used to value the subject bond. Using the rates in Exhibit 1, Peterson tasks her subordinate with valuing the bond issue (Objective 1). Exhibit 2 summarizes the results of his efforts.

Exhibit 1: Binomial Interest Rate Tree

Year 0	**Year 1**	**Year 2**
		Node 3-1
	10.254%	
3.000%		Node 3-2
	8.395%	
		10.413%

Exhibit 2: 5% Annual Coupon-Paying Bond Value Derived

Using the Binomial Interest Rate Tree

Year 0	Year 1	Year 2
		PV = 90.882
		Coupon = 5
	PV = 87.994	
	Coupon = 5	
91.962		PV= 93.153
		Coupon = 5
	Node 1-2:	
	PV = ?	
	Coupon = 5	
		PV = 95.098
		Coupon = 5

49. The value of the bond at Node 1-2 (Exhibit 2) is *closest* to:

   A. 86.84.
   B. 91.45.
   C. 96.45.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 5, Study Session 12, Reading 35, LOS d

The value of the bond at Node 1-2 Is equal to 91.1448 (see below):

$$0.5\left[\frac{93.153+5}{1.08395}\right] + 0.5\left[\frac{95.098+5}{1.08395}\right] = 91.448$$

A is incorrect. The calculated value excludes the coupon payments in Year 2.

C is incorrect. The value of a bond at any particular node is exclusive of coupon at that date..

50. Without performing any further calculations, an increase in the volatility assumption will cause forward rates to:

   A. spread out.
   B. remain unaffected.
   C. converge to the one year forward rate implied from the current yield curve.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 5, Study Session 12, Reading 35, LOS e

Increasing the volatility assumption will cause implied forward rates to become more spread out.

51. The process of interest rate tree calibration will *most likely* result in the implied opportunities for arbitrage:

   A. increasing.
   B. decreasing.
   C. remaining the same.

Correct Answer: B

Reference:
CFA Level 2, Volume 5, Study Session 12, Reading 35, LOS e

The process of calibration ensures that the interest rate tree generated is arbitrage-free. This implies that the process eliminates any opportunity to earn arbitrage profits. The interest rate tree is fit to the current yield curve so that the model produces benchmark bond values and thus there is no security mispricing.

52. In contrast to the valuation of option-free bonds using spot rates, the binomial interest rate tree will produce values which are:

   A. lower.
   B. higher.
   C. the same.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 5, Study Session 12, Reading 35, LOS f

A binomial interest rate tree should produce the same value for the bond as discounting by spot rates. This is because the binomial interest rate tree is calibrated to be arbitrage-free. Similarly the process of discounting a bond's cash flows using spot rates is arbitrage-free and thus the two methods should produce identical valuations.

53. With respect to Objective 5, mean reversion has the impact of moving interest rates towards:

    A. historical average forward rates.
    B. spot rates implied from the yield curve.
    C. forward rates implied from the yield curve.

Correct Answer: C

Reference:
CFA Level 2, Volume 5, Study Session 12, Reading 35, LOS h

Mean reversion is the tendency of interest rates to revert to an average over an extended period of time. With respect to the Monte Carlo simulation model, mean reversion will set upper and lower bounds on the random process generating interest rates. This implies that interest rates will have the effect of moving the interest rate toward the implied forward rates from the yield curve.

54. The rate at Node 3-1 is equal to:

    A. 11.508%.
    B. 12.718%.
    C. 15.534%.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 5, Study Session 12, Reading 35, LOS e

Forward rate (Node 3-1) = $10.413e^{(4 \times 0.10)}$ = 15.53437% or 15.534%

Questions 55 through 60 relate to Derivatives.

F-Line Associates Case Scenario

F-Line Associates is an investment management firm and manages a global equity fund titled Alpha. Benjamin Greene is Alpha's fund manager. Greene proposes that Alpha's mandate be revised to include entering in forward contracts for securing arbitrage profits.

As a starting point, Greene works alongside his subordinate, Alicia Jefferson, in drafting a manual which will explain the no-arbitrage principle underlying the pricing and valuation of forward contracts. He begins the manual with the following statement:

Statement 1: "If the cash and forward markets are priced correctly with respect to one another, we cannot secure positive cash flows today without incurring future liabilities."

Greene then moves on to test the no-arbitrage principle on a hypothetical 3-month equity forward contract. Greene assumes that the underlying stock does not pay dividends. Details concerning the forward contract have been summarized in Exhibit 1.

Exhibit 1

$S_0(T)$	$50.00
3-month annualized risk-free rate	1.25%
Time to expiration	3 months
Current market forward price	$51.31

Based on the data collected, Greene concludes the manual with the following statement:

Statement 2: "A cash and carry transaction will be profitable."

Jefferson believes that the manual is incomplete without addressing the impact of a planned decrease in policy rate by the Central Bank on forward prices.

Next, Greene considers the stock of Dexoc, a conglomerate which is headquartered in France. Greene would like to add a €5 million exposure of this stock to Alpha. He explains to Jefferson that there are two ways to acquire exposure:

A. Purchase shares of the stock today

B. Enter into a forward contract to purchase the underlying stock six months from today.

Deciding that option B is the cheaper of the two, Greene collects details required for pricing the equity forward contract in Exhibit 2.

Exhibit 2

Current market price	€20.50
Expected annual dividend	€0.75
Time to dividend payment	2 months
Annually compounded Euro risk-free rate	3.55%

Greene concludes his analysis of the Dexoc stock with a decision to remove the foreign exchange exposure. He achieves this by selling the euro investment amount forward against the US dollar at a rate of $0.90/€1 today for a period of six months. The annually compounded US risk-free rate is 3%. During the term of the contract, Greene's primary purpose is to consider the following two scenarios independently:

Scenario A: The impact on the percentage forward premium/discount if the Euro spot market exchange rate rises .

Scenario B: The value of the forward contract if the spot exchange rate one month later is $0.89/€1, while all else is held constant.

---

55. Considering Statement 1, the approach taken by Greene to price and value the hypothetical forward is based on the:

    A. law of one price.

    B. assumption that markets are frictional .

    C. presumption that the value of any portfolio is less than the sum of the value of each investment held in the portfolio.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 5, Study Session 14, Reading 39, LOS a

A is correct. The pricing and valuation of forward contracts is based on the no-arbitrage principle which implies that positive cash flows cannot be created today without any risk or future liability. Therefore, if both cash and the forward markets are priced correctly with respect to each other, creating a portfolio which generates positive cash flows today with no future liabilities is impossible. The no-arbitrage principle is based on the law of one price.

B is incorrect. The no-arbitrage principle will hold if market frictions are nil.

C is incorrect. The no-arbitrage principle is based on the law of one price which states that if two investments have the same or equivalent future cash flows, then these two investments should trade at the same price.

56. Is Greene correct with respect to the conclusion derived in Statement 2?

    A. Yes.
    B. No, an arbitrage strategy will not generate risk-free profits.
    C. No, a reverse cash and carry arbitrage will be profitable in the scenario.

Correct Answer: A

Reference:
Level II of CFA® Program Volume 5, Study Session 14, Reading 39, LOS a & b

A is correct. An arbitrage opportunity exists when the model or no-arbitrage price, represented by the equation: $S_0(1 + r)^T$, is not equal to the market forward price, $F_0(T)$. A cash and carry arbitrage involves buying the instrument and selling the forward contract. Therefore, this type of opportunity arises when the market forward price is greater than the model price.

Model price = $50(1.0125)^{3/12} = \$50.16$

Because the market forward price ($51.31) is greater than the calculated no-arbitrage price, Greene is correct in pointing out that a cash and carry arbitrage opportunity will be profitable.

57. The *most likely* impact of a decline in policy rate on the forward price is:

    A. neutral.
    B. a decrease.
    C. an increase.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 5, Study Session 14, Reading 39, LOS b

B is correct. Based on the equation for calculating the no-arbitrage price, $F_0(T) = S_0(1 + r)^T$, a decline in the interest rate (or policy rate in the context of the scenario) will lead to a decrease in the forward price.

58. Using the data in Exhibit 2, the no-arbitrage price for the six-month Dexoc equity forward contract is equal to:

    A. €19.87.
    B. €20.10.
    C. €20.86.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 5, Study Session 14, Reading 39, LOS b

B is correct. The no-arbitrage forward price for an equity forward contract when the underlying generates cash flows is equal to:
$F_0(T) = FV_{0,T}(S_0 + \theta_0 - y_0)$.

Based on the data in the exhibit, the present value of the dividend payment is €0.7456 [€0.75/$(1.0355)^{2/12}$].

$F_0(T) = (€20.50 + 0 - €0.7456)(1.0355)^{6/12} = €20.102 \approx €20.10$

59. Considering Scenario A, the percentage currency forward premium/discount will *most likely*:

    A. rise.
    B. decline.
    C. remain the same.

Correct Answer: C

Reference:
Level II of CFA® Program Volume 5, Study Session 14, Reading 39, LOS b

C is correct. The percentage currency forward premium/discount is only affected by changes in the US and Euro interest rates and time to expiration. Spot price expectations will not affect the percentage currency forward premium/discount .

60. Considering Scenario B, the value of the currency forward contract one month from today is equal to:

    A. $37,841.
    B. $59,266.
    C. €60,000.

Correct Answer: B

Reference:
Level II of CFA® Program Volume 5, Study Session 14, Reading 39, LOS b

The value of the forward contract one month from today is equal to the difference in foreign exchange forward prices.

$$V_t(T) = PV_{\$,t,T}[F_0(\$/€, T) - F_t(\$/€),T]$$

Euro forward price at contract initiation = $F_0(\$/€),T = \$0.90/€$ as given. One month later, the forward price is represented by $F_t(\$/€, T)$ and calculated as:

$$F_t(\$/€, T) = S_t[(1 + r_{DC})^T/(1 + r_{FC})^T] = \$/€\ 0.89[(1.03^{5/12})/(1.0355)^{5/12}] = \$/€\ 0.8880.$$

Therefore, $V_t(T) = [(0.9000 - 0.8880) \times €5,000,000]/(1.03)^{5/12}] = \$59,265.56 \approx \$59,266.$