Sample Level III Item-Set Questions

Questions 1 through 6 relate to Ethical and Professional Standards.

Weiying Shao Scenario

Weiying Shao, CFA, is an investment officer employed by Zhang Financial Services. Zhang provides wealth management services solely to high net worth individuals and has adopted the CFA Institute Standards and Asset Manager Code of Conduct.

Shao receives a request from a client asking for an itemized accounting of the actual fees and other costs charged to them for the year. Shao sends the client a document itemizing management fees paid by the client along with an explanation as to how the fees were derived.

Zhang has expanded its services recently to include proprietary mutual funds. Two experienced and respected research analysts were promoted to manage the new mutual funds.

Shao meets with Guohua Xu, a client who holds a diversified portfolio of funds. Traditionally, Shao has invested client assets in long-established funds with strong performance and management continuity. Because he has great respect for Zhang’s new products and their portfolio managers, Shao suggests investing a portion of Xu’s portfolio in one of the new Zhang funds. He recommends a fund with investment objectives similar to those of Xu. Shao provides performance data based on a simulated application of the fund’s approach over the past 18 months. He adds, “The new fund’s simulated performance is comparable to the performance of your current holdings over that period.”

Several clients ask Shao about hedge funds. After carefully screening for risk and return characteristics, Shao recommends selected hedge funds he finds appropriate for even conservative clients. The funds have had excellent performance so Shao believes they are appropriate despite their three year lock out provision. He discusses his research and recommendations with a colleague who responds “I don’t believe hedge funds are appropriate for any of our conservative clients, especially those with short-term liquidity needs.”

Periodically Shao reviews Zhang’s confidential proxy voting policy that is disclosed to clients only upon request. The policy directs investment officers to be selective when reviewing proxies, and to avoid spending time reviewing and voting routine proxies. In such cases, Zhang considers the cost involved for the client to be greater than the benefit that the client would receive.

Zhang has strict trade allocation procedures developed in accordance with the CFA Institute Standards and Asset Manager Code of Conduct. The firm distributes copies of the procedures to clients annually. Occasionally, Shao receives notice from the trading desk at the close of the day informing him that his block trades were only partially filled. Recently, when the trading desk could not execute the full $750,000 in stock that he had requested for two accounts, he allocated
$100,000 of the stock to the $5 million dollar private account and the remaining $500,000 of stock to a $25 million dollar institutional account.

During the next month, Zhang’s founder is accused by regulatory authorities of a number of violations including misappropriation of client funds. The same day, a team of senior portfolio managers leave Zhang to start their own firm. Zhang instructs its personnel not to discuss either of these developments with current or prospective clients.

1. Are the fee disclosures made by Shao to his client consistent with the CFA Institute Asset Manager Code of Professional Conduct?
   
   A. No.
   B. Yes, because Shao disclosed how fees are derived.
   C. Yes, because Shao itemized the management fees paid on the client’s behalf.

2. By recommending that Xu switch a portion of his portfolio to a new Zhang fund, does Shao violate any CFA Institute Standards of Professional Conduct?

   A. No.
   B. Yes, because he has a conflict of interest as the new funds are proprietary.
   C. Yes, because the fund data used in the performance comparison was simulated.

3. By recommending hedge funds, does Shao violate any CFA Institute Standards?

   A. No.
   B. Yes, because hedge funds have risk characteristics that are not suitable for conservative investors.
   C. Yes, because the hedge funds recommended are not suitable for conservative investors with short-term liquidity requirements.

4. Is Zhang’s proxy voting policy consistent with the requirements and recommendations of CFA Institute Standards and the Asset Manager Code of Conduct?

   A. Yes.
   B. No, because the proxy voting policy should be disclosed to all clients.
   C. No, because voting of all proxies is a part of the management of client investments.

5. When allocating the shares on the partially filled block order does Shao violate any CFA Institute Standards?

   A. No.
   B. Yes, because he fails to disclose the firm’s trade allocation policies.
   C. Yes, because he should allocate shares to client accounts only after the order is completely filled.
6. According to the CFA Institute Asset Manager Code of Conduct, Zhang must disclose the information regarding its:

A. founder only.
B. team of senior portfolio managers only.
C. both the founder and the team of senior portfolio managers.

Questions 7 through 12 relate to Risk Management Applications of Derivatives.

Joenia Dantas Case Scenario

Joenia Dantas is a financial risk manager for Alimentos Serra (AS), a Brazilian manufacturer and exporter of soybean-based food products. AS is a privately held corporation, wholly owned by Cesar Serra. Recently, AS took out a R25,000,000, four-year, floating-rate bank loan requiring semi-annual payments of interest based on SELIC (Banco Central do Brasil’s overnight lending rate) plus a spread of 4.50 percent and repayment of principal at maturity. Serra believes that interest rates will rise in the near future and worries that AS will be unable to absorb the higher loan costs associated with an increase in rates. Dantas tells him that she will convert the loan to a 10.80 percent fixed rate by entering into the pay-fixed side of a four-year, R25,000,000 notional principal interest rate swap with semi-annual payments that exchanges SELIC for a fixed rate of 10.80 percent. She explains that the swap will act as a hedge for the loan, reducing the company’s net cash flow risk and net market value risk.

Discussions with Dantas about using interest rate swaps to reduce risk cause Serra to think about the fixed income portion of his personal investment portfolio, which includes R12.0 million in bonds that have a modified duration of 5.50 years. Serra’s beliefs about rising interest rates make him want to reduce the bond portfolio’s modified duration to 2.00 years using interest rate swaps. In order to determine the correct swap position, he needs to learn how to calculate the modified duration of a swap. He asks Dantas how to do this. She explains it to him, using the example described in Exhibit 1.

<table>
<thead>
<tr>
<th>Maturity of swap</th>
<th>4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment structure</td>
<td>semiannual</td>
</tr>
<tr>
<td>Fixed rate on swap</td>
<td>10.8%</td>
</tr>
<tr>
<td>Duration of 4-year, 10.8% coupon bond</td>
<td>2.91 years</td>
</tr>
</tbody>
</table>

Serra decides to use a swap that has a modified duration of -2.40 years for the pay-fixed side to reduce his bond portfolio’s duration to the desired level.

Dantas knows that AS currently needs to borrow an additional R30,000,000 for 5 years to fund its growth. Brazilian credit markets have tightened and it would cost 17.70 percent per year to borrow this amount locally, but AS can obtain a yen-denominated loan at a fixed rate of 9.50 percent. This would expose it to substantial currency risk. A 5-year currency swap is available
in which AS would pay interest in real to the counterparty at 12.20 percent and receive interest in yen from the counterparty at 7.10 percent. The current exchange rate is ¥40/R.

In addition to the current needs, in six months AS will enter into a four-year, quarterly payment, R50,000,000 loan to fund local projects. Dantas expects to borrow these funds at a floating rate and convert the loan to fixed using an interest rate swap. She explains to Serra that AS can commit to a fixed rate of 14.3 percent for the future loan by buying a payer swaption today with an exercise rate of 14.3 percent for a four-year swap with quarterly payments and a notional principal amount of R50,000,000.

7. Dantas’ explanation of her plan to convert the four-year loan from floating to fixed is most likely:

   A. correct.
   B. incorrect, because the fixed loan rate will be 15.30%.
   C. incorrect, because the swap should be entered to pay SELIC.

8. Dantas’ characterization of the interest rate swap as a hedge for the bank loan is most likely:

   A. correct.
   B. incorrect, because the swap increases the cash flow risk of AS.
   C. incorrect, because the swap increases the market value risk of AS.

9. The duration of the interest rate swap described in Exhibit 1 is closest to:

   A. -2.41 years.
   B. -2.66 years.
   C. -2.91 years.

10. In order to reduce the duration of his bond portfolio to the desired level, Serra will enter into a pay-fixed swap position with a notional principal closest to:

    A. R17.5 million.
    B. R27.5 million.
    C. R42.0 million.

11. If AS enters into the yen-real currency swap with a notional principal of ¥1.2 billion (R40.0 million), net yen interest expense for each year is closest to:

    A. ¥28.80 million.
    B. ¥85.20 million.
    C. ¥114.00 million.
12. Dantas’ description of the use of a swaption in anticipation of future borrowing is:

A. correct.
B. incorrect, because AS should enter into a receiver swaption.
C. incorrect, because the fixed rate paid on the loan may be less than 14.3%.

Questions 13 through 18 relate to GIPS.

Redlands Case Scenario

Redlands Asset Management (RAM) is an active equity manager specializing in the Asian Pacific region. The firm was founded by Carol Schroeder, CFA at the beginning of 2006, with several members of her family serving as the firm’s first clients providing the initial managed assets for the firm.

Schroeder has compiled the information in Exhibit 1 and plans to use it to market RAM to institutional investors.

Exhibit 1
Redlands Asset Management GIPS Compliant Performance

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return Gross of Fees</td>
<td>44.8%</td>
<td>66.9%</td>
<td>80.7%</td>
</tr>
<tr>
<td>Benchmark Return</td>
<td>43.1%</td>
<td>60.2%</td>
<td>85.6%</td>
</tr>
<tr>
<td># of Portfolios</td>
<td>5</td>
<td>15</td>
<td>33</td>
</tr>
<tr>
<td>Composite Dispersion</td>
<td></td>
<td>6.7%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Period Ending Total Assets ($ millions)</td>
<td>350</td>
<td>760</td>
<td>1,630</td>
</tr>
<tr>
<td>% of Firm Assets</td>
<td>14%</td>
<td>25%</td>
<td>52%</td>
</tr>
</tbody>
</table>

Notes:
1. Performance results are presented gross-of fee so that they represent the return on assets reduced by any trading expenses incurred during the period.
2. The Asia-Pacific composite includes two non-fee-paying accounts of the Schroeder family.
3. A complete list and description of composites and their strategies, including any that have been discontinued within the last five years, is available upon request.
4. Portfolio valuations are computed monthly and are denominated in US dollars.
5. RAM uses cash-basis accounting for the recognition of interest income on its holdings of preferred stock.
6. The pricing source was changed prior to the end of the reporting period because, in management’s opinion, performance was not fairly represented. The new source has significantly improved the firm’s results.
7. RAM trades securities in illiquid markets with substantial political and economic risks so trades are recorded on a settlement date basis to ensure that these trades have been completed before they are included in performance calculations.
8. The composite presented above has been GIPS verified.

13. Which of the following performance presentation notes contains an error or omission that is most likely to prevent RAM from being in compliance with the GIPS standards?
   A. Composite list availability.
   B. Non-fee paying accounts disclosure.
   C. Disclosure concerning discontinued composites.

14. Which of the following performance presentation notes most likely comply with the recommendations and requirements of the GIPS standards?
   A. Pricing source.
   B. Cash-basis accounting.
   C. Returns calculated gross of fees.

15. Which of the following performance presentation notes would least likely prevent RAM from being in compliance with the GIPS standards?
   A. Monthly valuations.
   B. Non-fee paying accounts.
   C. Settlement-date accounting.

16. Which of the following concerning fees in RAM’s performance presentation most likely meets GIPS standards?
   A. Gross of fee labeling.
   B. The firm’s fee schedule.
   C. The deduction of any other fees.

17. Does RAM’s performance presentation most likely meet GIPS standards concerning dispersion?
   A. Yes.
   B. No, the method chosen must be disclosed.
   C. No, the standard deviation must be presented.
18. RAM’s verification *most likely* does not meet GIPS standards concerning verification because:

A. composite verification is not allowed.
B. the minimum time period has not been met.
C. the calculation methodology must be disclosed.

*Answers are provided beginning on the next page.*
**Answers to Sample Level III Item-Set Questions**

**Weiying Shao Scenario**

1. Are the fee disclosures made by Shao to his client consistent with the CFA Institute Asset Manager Code of Professional Conduct?

   A. No.
   B. Yes, because Shao disclosed how fees are derived.
   C. Yes, because Shao itemized the management fees paid on the client’s behalf.

   **Answer: A**

   *Asset Manager Code of Professional Conduct, CFA Institute*
   *2009 Modular Level III, Volume 1, p. 215*
   *Study Session 2-6-b*
   *Interpret the Asset Manager Code in situations presenting issues of compliance, disclosure, or professional conduct.*

   The Asset Manager Code of Conduct requires that managers disclose to each client the actual fees and other costs charged to them, together with itemizations of such charges, when requested by clients. The disclosure should include the specific management fee, incentive fee, and the amount of commissions the manager has paid on the client’s behalf during the period plus any other costs such as custodian fees. The Asset Manager Code of Conduct also requires managers to use plain language in presenting information to clients. Shao did not disclose all fees as commissions were left out and a description using plain language was also not used.

2. By recommending that Xu switch a portion of his portfolio to a new Zhang fund, does Shao violate any CFA Institute Standards of Professional Conduct?

   A. No.
   B. Yes, because he has a conflict of interest as the new funds are proprietary.
   C. Yes, because the fund data used in the performance comparison was simulated.

   **Answer: A**

   *“Guidance for Standards I-VII,” CFA Institute*
   *2009 Modular Level III, Volume 1, pp. 64-66, example 4*
   *Study Session 1-2-a*
   *Demonstrate a thorough knowledge of the Code of Ethics and Standards of Professional Conduct by interpreting the Code and Standards in various situations involving issues of professional integrity.*
Shao does not violate the Standards. He recommends a fund with similar investment objectives and discloses the use of simulated data in accordance with Standard III (D). The Standard requires members and candidates to avoid misstating performance or misleading clients. The Code does not prohibit the use of proprietary funds for clients.

3. By recommending hedge funds, does Shao violate any CFA Institute Standards?

   A. No.
   B. Yes, because hedge funds have risk characteristics that are not suitable for conservative investors.
   C. Yes, because the hedge funds recommended are not suitable for conservative investors with short-term liquidity requirements.

**Answer: C**

“Guidance for Standards I-VII,” CFA Institute
2009 Modular Level III, Volume 1, pp. 60-64
Study Session 1-2-a
Demonstrate a thorough knowledge of the Code of Ethics and Standards of Professional Conduct by interpreting the Code and Standards in various situations involving issues of professional integrity.

A member or candidate’s duty under Standard III(C) is satisfied with respect to a particular investment if they have thoroughly considered the investment’s place in the overall portfolio. Although Shao has performed appropriate due diligence prior to making his recommendation in regards to the return/risk characteristics he has not taken into consideration the particular short-term liquidity restrictions posed by the three-year lock up.

4. Is Zhang’s proxy voting policy consistent with the requirements and recommendations of CFA Institute Standards and the Asset Manager Code of Conduct?

   A. Yes.
   B. No, because the proxy voting policy should be disclosed to all clients.
   C. No, because voting of all proxies is a part of the management of client investments.

**Answer: B**

“Guidance for Standards I-VII,” CFA Institute
Asset Manager Code of Professional Conduct, CFA Institute
2009 Modular Level III, Volume 1, pp. 51, 203-204, 216.
Study Session 1-2-a and 1-6-b
Demonstrate a thorough knowledge of the Code of Ethics and Standards of Professional Conduct by interpreting the Code and Standards in various situations involving issues of professional integrity. Interpret the Asset Manager Code in situations presenting issues of compliance, disclosure, or professional conduct.

Zhang’s policy should be disclosed to all clients. Standard III (A) and the Asset Manager Code of Conduct (Section F.4.h) require members to disclose proxy-voting policies to all clients.

5. When allocating the shares on the partially filled block order does Shao violate any CFA Institute Standards?

A. No.
B. Yes, because he fails to disclose the firm’s trade allocation policies.
C. Yes, because he should allocate shares to client accounts only after the order is completely filled.

**Answer: A**


Shao allocates the shares on a pro rata basis such that each account receives a 2% allocation to the portfolio. To meet the fair dealing requirements of Standard III (B) shares must be allocated among participating client accounts pro rata on the basis of order size.

6. According to the CFA Institute Asset Manager Code of Conduct, Zhang must disclose the information regarding its:

A. founder only.
B. team of senior portfolio managers only.
C. both the founder and the team of senior portfolio managers.

**Answer: C**


Study Session 2-6-a, b
Summarize the ethical responsibilities required by the six components of the Asset Manager Code.
Interpret the Asset Manager Code in situations presenting issues of compliance, disclosure, or professional conduct.

Zhang must disclose both the information concerning the regulatory authorities and the information regarding the team of senior portfolio managers. The Asset Manager Code of Conduct requires that managers disclose material information that reasonable investors would want to know relative to whether or not they would choose to use or continue to use the Manager. In this regard, possible regulatory or disciplinary action taken against the manager or its personnel related to professional conduct would be considered “material”. The Code also requires that managers disclose significant personnel or organizational changes that have occurred.

**Joenia Dantas Case Scenario**

7. Dantas’ explanation of her plan to convert the four-year loan from floating to fixed is most likely:

   A. correct.
   B. incorrect, because the fixed loan rate will be 15.30%.
   C. incorrect, because the swap should be entered to pay SELIC.

**Answer: B**

“Risk Management Applications of Swap Strategies,” Don M. Chance, CFA
2009 Modular Level III, Volume 5, pp. 444-445
Study Session 15-44-a
Demonstrate how an interest rate swap can be used to convert a floating-rate (fixed-rate) loan to a fixed-rate (floating-rate) loan.

Converting a floating-rate loan to a fixed-rate loan requires entering into a plain-vanilla (fixed-for-floating) interest rate swap on the pay-fixed side. The swap should have the same maturity, the same payment frequency, and the same floating interest rate index as the loan and its notional principal should be equal to principal balance of the loan. The borrower will pay the fixed rate on the swap (here 10.80%) and receive the index (SELIC) from the swap counterparty. The borrower will pay the index (SELIC) plus any spread (4.50%) to the lender. The net, fixed interest rate on the swapped loan is the fixed rate on the swap plus any spread over index on the loan or 10.80% + 4.50% = 15.30% in this situation.
8. Dantas’ characterization of the interest rate swap as a hedge for the bank loan is most likely:

A. correct.
B. incorrect, because the swap increases the cash flow risk of AS.
C. incorrect, because the swap increases the market value risk of AS.

Answer: C

“Risk Management Applications of Swap Strategies,” Don M. Chance, CFA
2009 Modular Level III, Volume 5, pp. 445-446
Study Session 15-44-c

Explain the impact to cash flow risk and market value risk when a borrower converts a fixed-rate loan to a floating rate loan.

The original loan is floating rate. A floating rate loan has very low duration and therefore little market value risk. It might, as Serra suggests, pose a cash flow risk if the firm is not able to handle the increase in loan payments associated with an increase in market interest rates. Using an interest rate swap to convert the loan from a floating rate to a fixed rate reduces the cash flow risk. However, the resulting fixed rate loan has a much higher duration and its market value will therefore fluctuate much more drastically as market interest rates change.

9. The duration of the interest rate swap described in Exhibit 1 is closest to:

A. -2.41 years.
B. -2.66 years.
C. -2.91 years.

Answer: B

“Risk Management Applications of Swap Strategies,” Don M. Chance, CFA
2009 Modular Level III, Volume 5, pp. 445-446
Study Session 15-44-b

Calculate and interpret the duration of an interest rate swap.

The duration of the pay-fixed position in an interest rate swap is equal to the duration of a floating rate bond with the same payment frequency minus the duration of a fixed rate bond with coupon rate equal to the fixed rate and maturity equal to the swap maturity. The duration of the floating rate bond is, on average, half of the time interval between payments (in this case, half of 0.5 years or 0.25 years.) The duration of the fixed rate bond is given as 2.91 years. 0.25 years-2.91 years = -2.66 years.
10. In order to reduce the duration of his bond portfolio to the desired level, Serra will enter into a pay-fixed swap position with a notional principal closest to:

A. R17.5 million.  
B. R27.5 million.  
C. R42.0 million.

Answer: A

“Risk Management Applications of Swap Strategies,” Don M. Chance, CFA  
2009 Modular Level III, Volume 5, pp. 447-450  
Study Session 15-44-d  
Determine the notional principal value needed on an interest rate swap to achieve a desired level of duration in a fixed income portfolio.

When the current duration (DB), the target duration (DT), and the value (B) of the bond portfolio are known and the duration of the swap has been calculated, the notional principal of the appropriate swap (NP) is found as:

\[ NP = B \left( \frac{MDUR}{\ldots} \right) \]

In this case, the notional principal is:

\[ 12,000,000 \left( \frac{2.00}{-2.00} \right) \cdot 5.50 = 17,500,000. \]

11. If AS enters into the yen-real currency swap with a notional principal of ¥1.2 billion (R40.0 million), net yen interest expense for each year is closest to:

A. ¥28.80 million.  
B. ¥85.20 million.  
C. ¥114.00 million.

Answer: A

“Risk Management Applications of Swap Strategies,” Don M. Chance, CFA  
2009 Modular Level III, Volume 5, pp. 455-458  
Study Session 15-44-e  
Explain how a company can generate savings by issuing a loan or bond in its own currency and using a currency swap to convert the obligation into another currency.

If AS borrows in yen, it will borrow ¥1.2 billion (=R30,000,000 × ¥40/R). In order to hedge this, it will enter into a currency swap with a notional principal of ¥1.2
billion/R30,000,000. It will receive 7.10% in yen from the swap and pay 9.50% in yen on the loan, for a net payment of 2.40% (on ¥1.2 billion) or ¥28.80 million.

12. Dantas’ description of the use of a swaption in anticipation of future borrowing is:

A. correct.
B. incorrect, because AS should enter into a receiver swaption.
C. incorrect, because the fixed rate paid on the loan may be less than 14.3%.

Answer: C

“Risk Management Applications of Swap Strategies,” Don M. Chance, CFA
2009 Modular Level III, Volume 5, pp. 475-478
Study Session 15-44-h
Demonstrate the use of an interest rate swaption (1) to change the payment pattern of an anticipated future loan and (2) to terminate a swap.

The payer swaption gives AS the right (but not the obligation) to enter into the desired swap position at a fixed rate of 14.3%. In six months, the market (fixed) rate on a four-year swap may be less than 14.3%, in which case the swaption will be out-of-the-money and will expire worthless. In such case, AS will enter into the desired swap at a rate of less than 14.3%.

Redlands Case Scenario

13. Which of the following performance presentation notes contains an error or omission that is most likely to prevent RAM from being in compliance with the GIPS standards?

A. Composite list availability.
B. Non-fee paying accounts disclosure.
C. Disclosure concerning discontinued composites.

Answer: B

Global Investment Performance Standards, Philip Lawton, CFA, and W. Bruce Remington, CFA
2009 Level III, Volume 6, pp. 274, 281, 311
Study Session 18-49-s
Identify errors and omissions in given performance presentations, including real estate and private equity performance presentations.

The percentage of the composite which non-fee paying accounts represent should be disclosed, (Provision II.5A.7).
14. Which of the following performance presentation notes most likely comply with the recommendations and requirements of the GIPS standards?

A. Pricing source.
B. Cash-basis accounting.
C. Returns calculated gross of fees.

**Answer: C**

Global Investment Performance Standards, Philip Lawton, CFA, and W. Bruce Remington, CFA
2009 Level III, Volume 6, pp. 246, 274
Study Session 18-49-I, s
State the requirements and recommendations of the GIPS standards with respect to presentation and reporting, including the required timeframe of compliant performance records, annual returns, composite market values, and benchmarks. Identify errors and omissions in given performance presentations, including real estate and private equity performance presentations.

Returns must be clearly labeled as gross of fees or net of fees (Provision II.4.A.6).

15. Which of the following performance presentation notes would least likely prevent RAM from being in compliance with the GIPS standards?

A. Monthly valuations.
B. Non-fee paying accounts.
C. Settlement-date accounting.

**Answer: A**

Global Investment Performance Standards, Philip Lawton, CFA, and W. Bruce Remington, CFA
2009 Level III, Volume 6, pp. 246, 247, 281
Study Session 18-49-d, s
State the requirements and recommendations of the GIPS standards with respect to input data, including accounting policies related to asset valuation and performance measurement.
Identify errors and omissions in given performance presentations, including real estate and private equity performance presentations.

GIPS recommends performance presentations include returns for quarterly and/or shorter time periods (Provisions II.1.A.3-4).
16. Which of the following concerning fees in RAM’s performance presentation most likely meets GIPS standards?

A. Gross of fee labeling.
B. The firm’s fee schedule.
C. The deduction of any other fees.

**Answer: A**

Global Investment Performance Standards, Philip Lawton, CFA, and W. Bruce Remington, CFA
2009 Level III, Volume 6, p. 274
Study Session 18-49-k
State the requirements and recommendations of the GIPS standards with respect to disclosures, including fees; the use of leverage and derivatives; conformity with local laws and regulations that conflict with the GIPS standards: and non-compliant performance records.

The GIPS standards requires that returns be clearly labeled as gross of fees or net of fees (Provision II.4.A.6).

17. Does RAM’s performance presentation most likely meet GIPS standards concerning dispersion?

A. Yes.
B. No, the method chosen must be disclosed.
C. No, the standard deviation must be presented.

**Answer: B**

Global Investment Performance Standards, Philip Lawton, CFA, and W. Bruce Remington, CFA
2009 Level III, Volume 6, p. 275
Study Session 18-49-n
Evaluate the relative merits of high/low, interquartile range, and standard deviation as measures of the dispersion of portfolio returns within a composite.

The GIPS standards require firms to disclose which dispersion measure is presented. (Provision II.4.A.26).

18. RAM’s verification most likely does not meet GIPS standards concerning verification because:

A. composite verification is not allowed.
B. the minimum time period has not been met.
C. the calculation methodology must be disclosed.
The GIPS standards specifically prohibit firms from stating that a particular composite presentation has been “GIPS verified,” (Provision III.C).
The Morning Session of the 2015 Level III CFA® Examination has 11 questions. For grading purposes, the maximum point value for each question is equal to the number of minutes allocated to that question.

<table>
<thead>
<tr>
<th>Question</th>
<th>Topic</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Portfolio Management – Institutional</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Portfolio Management – Institutional</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>Portfolio Management – Fixed Income</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>Portfolio Management – Alternative Investments</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Portfolio Management – Performance Evaluation</td>
<td>15</td>
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<tr>
<td>6</td>
<td>Portfolio Management – Risk Management</td>
<td>14</td>
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<tr>
<td>7</td>
<td>Portfolio Management – Individual</td>
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<td>10</td>
<td>Portfolio Management – Economics</td>
<td>14</td>
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<tr>
<td>11</td>
<td>Portfolio Management – Individual/Behavioral</td>
<td>18</td>
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</tbody>
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**Total:** 180
Saylor Guitars was established 25 years ago in the US. Today, the company employs a highly-skilled workforce to produce handmade guitars. Ten years ago, the company instituted a defined-benefit pension plan (the Plan). There is no provision for early retirement. The average age of the workforce is 35 years, and there are no current pension recipients.

Until last year, Saylor made annual contributions to the Plan and it had a surplus. However, the latest economic downturn reduced sales of Saylor’s premium-priced guitars, which resulted in lower profitability. This led the company to omit Plan contributions and now the Plan is just fully funded with no surplus. Customer orders have begun to increase with an improvement in the overall economy. Based on past experience, the company is forecasting that it will return to its typical high profit levels in the next several months. Saylor also expects to resume its contributions to the Plan in the first half of the upcoming year.

The average annual return on the Plan’s asset portfolio since inception has been 4.8%. The portfolio is well-diversified across asset classes and has low return correlation with the broad equity market. Saylor uses a discount rate of 4.5% to compute its pension benefit obligation. The expected inflation rate is 1.5%. Saylor’s debt-to-assets ratio is 0.42 compared to the industry average of 0.40.

A. **Determine** whether the risk tolerance of the Plan is below-average or above-average. **Justify** your response with two reasons.

   Note: Restating case facts is an incomplete justification and will not receive credit.

   **5 minutes (Answer 1-A on page 3)**

B. **State** the minimum return requirement of the Plan. **Explain** your response.

   **4 minutes (Answer 1-B on page 4)**

One month later, Saylor’s management decides to offer to employees over age 50, a one-time lump-sum early retirement option that will be payable next year. Ten percent of Saylor’s employees accept this option.

C. **Discuss** how the acceptance of the early retirement option changed each of the following:

   i. Liquidity requirement
   ii. Duration of Plan liabilities

   **5 minutes (Answer 1-C on page 5)**
1-A. **Determine** whether the risk tolerance of the Plan is below-average or above-average. **Justify** your response with *two* reasons.

Note: Restating case facts is an incomplete justification and will not receive credit.
1-B. **State** the minimum return requirement of the Plan. **Explain** your response.
Answer Question 1-C on This Page

1-C. **Discuss** how the acceptance of the early retirement option changed *each* of the following:

i. Liquidity requirement

ii. Duration of Plan liabilities
Questions 1 and 2 relate to Saylor Guitars and Sandeep Nayar. A total of 31 minutes is allocated to these questions. Candidates should answer these questions in the order presented.

QUESTION 2 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 17 MINUTES.

Two years have passed and the fund manager for Saylor Guitars’ defined-benefit pension plan (the Plan) is Sandeep Nayar. The Plan’s portfolio currently has an asset allocation of 80% nominal bonds and 20% equities. Nayar believes the portfolio lies on the efficient frontier and the returns have a relatively low correlation with Saylor’s operating results.

The profile of the Plan is presented in Exhibit 1.

<table>
<thead>
<tr>
<th>Exhibit 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saylor Pension Plan Profile</td>
</tr>
<tr>
<td>Average age of workforce</td>
</tr>
<tr>
<td>Retirement age</td>
</tr>
<tr>
<td>Percentage of retired lives</td>
</tr>
<tr>
<td>Expected annual wage growth</td>
</tr>
</tbody>
</table>

Retirement benefits are fully indexed for inflation. Expected annual wage growth includes wage inflation of 1% and productivity increases of 3%.

During a meeting with the company founder, Tom Anderson, Nayar describes his approach to managing pension risk as an asset-only approach. Anderson asks about other approaches to managing pension risk. Nayar explains the liability-relative approach to pension fund investing.

A. Contrast Nayar’s approach with the liability-relative approach for each of the following:

   i. The Plan’s liability risk exposure
   ii. The characteristics of a low-risk investment

   6 minutes (Answer 2-A on page 8)

B. Recommend two changes to the Plan’s current asset allocation that would be consistent with the liability-relative approach. Justify each response.

   6 minutes (Answer 2-B on page 9)

Nayar also manages the investment portfolio of the Anderson Community Foundation (the Foundation). The purpose of the Foundation is to provide scholarships to local students for graduate study in science. The Foundation is intended to operate in perpetuity. The Foundation’s Board instructs Nayar to take a conservative approach to managing the investment portfolio. There is a 5% annual spending goal but no minimum spending requirement.
C. **Determine** whether the Foundation’s ability to take risk is lower than, equal to, or higher than that of the Saylor pension plan. **Justify** your response with *two* reasons.

Note: Restating case facts is an incomplete justification and will not receive credit.

*5 minutes (Answer 2-C on page 10)*
2-A. **Contrast** Nayar’s approach with the liability-relative approach for *each* of the following:

i. The Plan’s liability risk exposure

ii. The characteristics of a low-risk investment
2-B. **Recommend** *two* changes to the Plan’s current asset allocation that would be consistent with the liability-relative approach. **Justify each response.**
Answer Question 2-C on This Page

Note: Restating case facts is an incomplete justification and will not receive credit.

<table>
<thead>
<tr>
<th>Determine whether the Foundation’s ability to take risk is lower than, equal to, or higher than that of the Saylor pension plan. (circle one)</th>
<th>Justify your response with two reasons.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>lower than</td>
</tr>
<tr>
<td>2.</td>
<td>equal to</td>
</tr>
<tr>
<td></td>
<td>higher than</td>
</tr>
</tbody>
</table>
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MARKS MADE ON THIS PAGE ARE NOT GRADED
Camille Blanc is a fixed income manager who recently started the Optima mutual fund. The fund is invested in a diversified portfolio of government and corporate bonds. The fund’s mandate requires the effective duration of its portfolio to match that of its benchmark. Blanc’s objective is to outperform a fixed-income benchmark by using an enhanced-indexing strategy.

Blanc evaluates the price sensitivities of Optima relative to its benchmark for changes in the yield curve using scenario analysis:

- **Scenario 1:** She simulates an immediate 10 basis point (bps) parallel shift in the yield curve and finds no difference in the price sensitivities between Optima and its benchmark.
- **Scenario 2:** She simulates an immediate 30 bps change in the 5-year spot rate and holds all other rates constant. She finds a 19 bps difference in the price sensitivities between Optima and its benchmark.

**A.** Determine whether Optima *most likely* violates its mandate under each of the following:

i. Scenario 1
ii. Scenario 2

**Justify** your response for each scenario.

Note: Consider each scenario independently.

**6 minutes (Answer Question 3-A on page 14)**

Both Optima and its benchmark hold positions in Treasury bonds, non-callable corporate bonds, and callable corporate bonds. Based on her analysis of the market, Blanc expects credit spreads to narrow and yields to experience a downward parallel shift. She evaluates the following trade: buy a callable corporate bond and sell a non-callable corporate bond of the same maturity and credit quality. Both bonds are trading at par.

**B.** Determine, given Blanc’s expectations, whether she should implement the trade. **Justify** your response.

Note: Ignore transaction costs and assume volatility is unchanged.

**3 minutes (Answer Question 3-B on page 15)**
One year later, Blanc is managing another mutual fund, Intrepid, which is more actively managed than Optima. Blanc forecasts a stronger economy and an upward parallel shift in the yield curve. She evaluates the following two trades:

Trade 1: Buy a 10-year Ba1/BB+ consumer cyclical sector bond and sell a 10-year Baa3/BBB– consumer cyclical sector bond of another issuer

Trade 2: Buy a 3-year non-callable bond with a 5% coupon and sell a 3-year non-callable bond with a zero coupon of the same issuer and credit quality

C. **Determine** the expected effect (negative, no effect, positive) on Intrepid’s performance from each of the following trades, assuming Blanc’s forecasts are realized:

i. Trade 1
ii. Trade 2

**Justify** each response.

Note: Ignore transaction costs and assume volatility is constant.

6 minutes (Answer Question 3-C on page 16)

Blanc decides to add another bond to the Intrepid portfolio. She uses mean-reversion analysis to determine which of the three bonds shown in Exhibit 1 to purchase. The three bonds have similar durations. Their credit spreads are normally distributed and no structural changes are expected in the market.

<table>
<thead>
<tr>
<th>Exhibit 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Bond Purchases</td>
</tr>
<tr>
<td>Credit Spread and Standard Deviation (in bps)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bond</th>
<th>Current Spread</th>
<th>Historical Mean Spread</th>
<th>Standard Deviation of Spread</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aries</td>
<td>300</td>
<td>210</td>
<td>50</td>
</tr>
<tr>
<td>Libra</td>
<td>320</td>
<td>230</td>
<td>30</td>
</tr>
<tr>
<td>Taurus</td>
<td>340</td>
<td>240</td>
<td>40</td>
</tr>
</tbody>
</table>

D. **Determine** the most appropriate bond to purchase using mean-reversion analysis. **Justify** your response.

4 minutes (Answer Question 3-D on page 17)
3-A. **Determine** whether Optima *most likely* violates its mandate under *each* scenario. **Justify** your response for *each* scenario.

Note: Consider *each* scenario independently.

i. Scenario 1

ii. Scenario 2
3-B. **Determine**, given Blanc’s expectations, whether she should implement the trade. **Justify** your response.

Note: Ignore transaction costs and assume volatility is unchanged.
**Answer Question 3-C on This Page**

Note: Ignore transaction costs and assume volatility is constant.

<table>
<thead>
<tr>
<th>Trade</th>
<th>Determine the expected effect (negative, no effect, positive) on Intrepid’s performance from each of the following trades, assuming Blanc’s forecasts are realized. (circle one)</th>
<th>Justify each response.</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Trade 1</td>
<td>negative</td>
<td></td>
</tr>
<tr>
<td></td>
<td>no effect</td>
<td></td>
</tr>
<tr>
<td></td>
<td>positive</td>
<td></td>
</tr>
<tr>
<td>ii. Trade 2</td>
<td>negative</td>
<td></td>
</tr>
<tr>
<td></td>
<td>no effect</td>
<td></td>
</tr>
<tr>
<td></td>
<td>positive</td>
<td></td>
</tr>
</tbody>
</table>
3-D. **Determine** the *most* appropriate bond to purchase using mean-reversion analysis. **Justify** your response.
The Vizyon Foundation promotes scientific research in the US. Vizyon’s investment portfolio is allocated 60% to equities and 40% to bonds. Given the low-return environment, Vizyon is researching opportunities to expand into different assets and hires an analyst, Olivia Andrich, to lead this effort.

Vizyon’s trustees are evaluating the expected impact on the Foundation’s portfolio characteristics if they reallocate 10% of existing equities to non-leveraged direct real estate investments. Andrich wants to determine the index that best represents the portfolio characteristics of direct real estate investments and examines the indices in Exhibit 1. The expected Sharpe ratio of Vizyon’s current portfolio is 0.70.

<table>
<thead>
<tr>
<th>Index</th>
<th>Index Characteristics</th>
<th>Expected Sharpe Ratio of the Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAREIT</td>
<td>Security-based</td>
<td>0.81</td>
</tr>
<tr>
<td>NAREIT (hedged)</td>
<td>Security-based</td>
<td>0.71</td>
</tr>
<tr>
<td>NCREIF</td>
<td>Appraisal-based</td>
<td>0.79</td>
</tr>
<tr>
<td>NCREIF (unsmoothed)</td>
<td>Appraisal-based</td>
<td>0.74</td>
</tr>
</tbody>
</table>

A. **Determine** the *most* appropriate index to represent the expected characteristics of Vizyon’s proposed investment in real estate. **Justify** your response with *two* reasons.

Vizyon’s trustees recently received two real estate investment proposals. The first proposal is to acquire a privately owned shopping center valued at USD 230 million. The second proposal is to acquire 10% of the equity in a publicly listed hotel chain with a USD 2.3 billion market capitalization. Andrich summarizes the key points of the two proposals in Exhibit 2. She expects a higher return from the shopping center.

<table>
<thead>
<tr>
<th>Direct Investment in Shopping Center</th>
<th>Public Equity Investment in Hotel Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Luxury shopping center located in a fashionable district</td>
<td>• Budget hotel chain offering affordable accommodations across the US</td>
</tr>
<tr>
<td>• 100% privately owned by the original owner since development 7 years ago</td>
<td>• Listed on the New York Stock Exchange for 10 years</td>
</tr>
<tr>
<td>• Fixed transaction cost of USD 18 million</td>
<td>• 10 million shares outstanding</td>
</tr>
<tr>
<td></td>
<td>• Estimated transaction cost of 18 basis points (bps)</td>
</tr>
<tr>
<td></td>
<td>• Hotel chain’s board rejected several buyout offers from different investors in the past 5 years</td>
</tr>
</tbody>
</table>
B. **Discuss**, based *only* on the information provided, *three* disadvantages to Vizyon of a direct investment in the shopping center relative to an investment in the publicly traded equity of the hotel chain.

6 minutes (Answer Question 4-B on page 21)

Next, Andrich considers an investment in distressed debt. She uses a 3-year horizon for evaluating the investment. Andrich analyzes Khepri Capital, a newly formed distressed debt hedge fund, and notes the following about Khepri:

- 1% annual management fee on average NAV
- 15% performance fee paid monthly and calculated based on the monthly change in NAV, subject to a high-water mark provision
- 3-year lock-up period
- 14% of NAV is invested in a distressed automotive company that recently filed for bankruptcy protection
- NAV per unit at the end of May was a new all-time high of USD 3,100

Khepri Capital’s subsequent month-end NAV per unit was USD 3,260 in June, USD 2,900 in July, and USD 3,140 in August. There were no interim cash flows from clients during this three-month period.

C. **Calculate** the performance fee (in USD per unit) for the three months from June to August.

3 minutes (Answer Question 4-C on page 22)

D. **Explain** why Khepri Capital is subject to J-factor risk.

3 minutes (Answer Question 4-D on page 23)

Andrich learns of a competing distressed debt hedge fund with a similar performance fee and expected return, but only a 1-year lock-up period. Andrich contacts Khepri Capital and states that she is considering investing in the competitor’s fund. A representative for Khepri Capital replies that its 3-year lock-up period is likely to be more favorable to Vizyon than the competitor’s 1-year lock-up period.

E. **Support** the representative’s reply about Khepri Capital’s lock-up period.

3 minutes (Answer Question 4-E on page 24)
4-A. **Determine** the *most* appropriate index to represent the expected characteristics of Vizyon’s proposed investment in real estate. **Justify** your response with *two* reasons.
4-B. Discuss, based only on the information provided, three disadvantages to Vizyon of a direct investment in the shopping center relative to an investment in the publicly traded equity of the hotel chain.
4-C. **Calculate** the performance fee (in USD per unit) for the three months from June to August.
4-D. Explain why Khepri Capital is subject to J-factor risk.
Answer Question 4-E on This Page

4-E. **Support** the representative’s reply about Khepri Capital’s lock-up period.
Javier Costa is an analyst for a fund sponsor in Latin America. The fund sponsor uses two equity managers (Manager A and Manager B) and each invests in developed and emerging markets.

Costa prepares a performance attribution analysis for the total fund. He identifies the fund’s sources of return and develops the macro attribution table in Exhibit 1.

**Exhibit 1**
**Total Fund Level**
**Macro Attribution for 1 January – 31 March**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning value</td>
<td>360,000,000</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Risk-free asset</td>
<td>361,800,000</td>
<td>0.50</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Asset category</td>
<td>388,872,000</td>
<td>7.52</td>
<td>27,072,000</td>
</tr>
<tr>
<td>Benchmarks</td>
<td>389,376,000</td>
<td>0.14</td>
<td>504,000</td>
</tr>
<tr>
<td>Investment managers</td>
<td>389,664,000</td>
<td>0.08</td>
<td>288,000</td>
</tr>
<tr>
<td>Allocation effects</td>
<td>389,304,000</td>
<td>-0.10</td>
<td>(360,000)</td>
</tr>
<tr>
<td>Total fund</td>
<td>389,304,000</td>
<td>8.14</td>
<td>29,304,000</td>
</tr>
</tbody>
</table>

**A. Demonstrate** whether the total fund outperformed a pure indexing strategy.

*3 minutes (Answer Question 5-A on page 28)*

**B. Determine** how much of the fund’s return was due to each of the following:

i. Style bias
ii. Active management

*4 minutes (Answer Question 5-B on page 29)*

Costa gathers the information in Exhibit 2 to evaluate the performance of Manager A.

**Exhibit 2**
**Equity Manager A**
**Valuations and Cash Flows**
(in USD)

<table>
<thead>
<tr>
<th>Date</th>
<th>Contribution/(Withdrawal)</th>
<th>Market Value (After Cash Flows)</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 March</td>
<td>---</td>
<td>121,000,000</td>
</tr>
<tr>
<td>8 April</td>
<td>13,000,000</td>
<td>135,000,000</td>
</tr>
<tr>
<td>23 April</td>
<td>(8,000,000)</td>
<td>127,000,000</td>
</tr>
<tr>
<td>30 April</td>
<td>---</td>
<td>123,000,000</td>
</tr>
</tbody>
</table>
C. **Calculate** the time-weighted rate of return for Manager A for the month of April. **Show** your calculations.

4 minutes (Answer Question 5-C on page 30)

Next, Costa presents the micro attribution analysis for Manager B shown in Exhibit 3. Manager B’s objective is to outperform her benchmark through superior security selection.

### Exhibit 3
**Equity Manager B**
**Micro Attribution**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Portfolio Weight (%)</th>
<th>Benchmark Weight (%)</th>
<th>Portfolio Return (%)</th>
<th>Benchmark Return (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer durables</td>
<td>21.53</td>
<td>28.70</td>
<td>9.47</td>
<td>4.16</td>
</tr>
<tr>
<td>Energy</td>
<td>34.91</td>
<td>45.44</td>
<td>8.21</td>
<td>5.43</td>
</tr>
<tr>
<td>Financial</td>
<td>31.35</td>
<td>11.79</td>
<td>6.82</td>
<td>4.98</td>
</tr>
<tr>
<td>Technology</td>
<td>12.21</td>
<td>14.07</td>
<td>–9.02</td>
<td>–1.71</td>
</tr>
<tr>
<td>Total portfolio</td>
<td>100.00</td>
<td>100.00</td>
<td>5.94</td>
<td>4.01</td>
</tr>
</tbody>
</table>

D. **Calculate each** of the following for Manager B:

i. Pure sector allocation return for the Financial sector
ii. Within-sector selection return for the Technology sector

**Show** your calculations.

Note: Ignore interaction effects.

4 minutes (Answer Question 5-D on page 31)
5-A. Demonstrate whether the total fund outperformed a pure indexing strategy.
Answer Question 5-B on This Page

5-B. **Determine** how much of the fund’s return was due to *each* of the following:

i. Style bias

ii. Active management
5-C. Calculate the time-weighted rate of return for Manager A for the month of April. Show your calculations.
Answer Question 5-D on This Page

5-D. Calculate each of the following for Manager B. Show your calculations.

Note: Ignore interaction effects.

i. Pure sector allocation return for the Financial sector.

ii. Within-sector selection return for the Technology sector.
Tartan Management is a hedge fund that uses derivatives in its portfolio. Tartan’s new director of risk management, Jan Magnuson, is reviewing Tartan’s credit risk exposures. Tartan’s current policy is to use a different counterparty for each derivative holding to limit its credit exposure to any single counterparty. Its current derivatives holdings are shown in Exhibit 1. All derivatives are over-the-counter (OTC) and are not subject to collateral requirements.

### Exhibit 1
Derivatives Holdings of Tartan Management
(all figures in USD)

<table>
<thead>
<tr>
<th>Holding</th>
<th>Description</th>
<th>Notional Principal</th>
<th>Current Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest swap</td>
<td>1 year; quarterly payments; pay floating, receive fixed</td>
<td>2,000,000</td>
<td>56,000</td>
</tr>
<tr>
<td>Forward</td>
<td>2 years; long natural gas</td>
<td>5,000,000</td>
<td>-225,000</td>
</tr>
<tr>
<td>Option</td>
<td>6 months; long call option on S&amp;P 500 equity index</td>
<td>5,000,000</td>
<td>487,000</td>
</tr>
</tbody>
</table>

**A.** **Determine** Tartan’s total amount (in USD) at risk of credit loss from its derivatives portfolio under its current policy.

**4 minutes (Answer Question 6-A on page 34)**

Magnuson considers whether Tartan’s credit risk in the event of a default could be reduced by using a single counterparty with payment netting for all derivatives. The single counterparty would be a different company than any of the three current counterparties.

**B.** **Discuss**, based on Tartan’s current holdings shown in Exhibit 1, *one* positive effect and *one* negative effect that payment netting with a single counterparty could have on Tartan’s credit risk.

Note: Assume there is no difference in the cost of credit monitoring between the two alternatives.

**4 minutes (Answer Question 6-B on page 35)**

Magnuson wants to reduce the credit risk that Tartan might incur with derivative positions in the future. He asks his staff to research sources of credit risk. The staff recommends the following for Tartan:

Recommendation 1: Use only currency futures rather than currency swaps.

Recommendation 2: Buy OTC put options rather than write OTC call options.
C. **Determine** whether *each* of the following recommendations would *most likely* achieve Magnuson’s objective of reducing credit risk:

i. Recommendation 1
ii. Recommendation 2

_Justify each_ response.

_6 minutes (Answer Question 6-C on page 36)_
Answer Question 6-A on This Page

6-A. Determine Tartan’s total amount (in USD) at risk of credit loss from its derivatives portfolio under its current policy.
Answer Question 6-B on This Page

6-B. Discuss, based on Tartan’s current holdings shown in Exhibit 1, one positive effect and one negative effect that payment netting with a single counterparty could have on Tartan’s credit risk.

Note: Assume there is no difference in the cost of credit monitoring between the two alternatives.
Answer Question 6-C on This Page

6-C. **Determine** whether *each* of the following recommendations would *most likely* achieve Magnuson’s objective of reducing credit risk. **Justify each** response.

i. Recommendation 1.

ii. Recommendation 2.
Questions 7 and 8 relate to the Betty Friesen family. A total of 34 minutes is allocated to these questions. Candidates should answer these questions in the order presented.

QUESTION 7 HAS FOUR PARTS (A, B, C, D) FOR A TOTAL OF 18 MINUTES.

Adrian Tuggle is a financial advisor counseling Betty Friesen and her husband, Jack Friesen. Betty is 79 years old and has a 42-year-old son, Ryan Smith, from a previous marriage. Ryan has 18-year-old twin daughters. Betty wishes to provide for her family, but intends to donate the majority of her assets to charity. Betty’s total asset base is currently USD 120,000,000.

Betty lives in a community property jurisdiction that entitles Jack to receive half of the community property tax-free upon her death. Most of Betty’s wealth is considered separate property, with the community property amounting to only 10% of her total assets. Exhibit 1 summarizes gift and inheritance tax rates applicable to the Friesen family.

<table>
<thead>
<tr>
<th>Tax Type</th>
<th>Tax Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spousal inheritance tax</td>
<td>20%</td>
</tr>
<tr>
<td>Spousal gift tax</td>
<td>25%</td>
</tr>
<tr>
<td>Non-spousal inheritance tax</td>
<td>50%</td>
</tr>
<tr>
<td>Non-spousal gift tax</td>
<td>30%</td>
</tr>
</tbody>
</table>

Note: All taxes are due immediately at the time of the transfer and are paid for by the recipient.

Betty feels that Jack’s legal entitlement under the community property rules will not be sufficient to meet his financial needs. Tuggle estimates that if Betty were to die today, Jack would need to inherit USD 8,000,000 net of any taxes to meet his needs.

A. **Calculate** the minimum bequest (in USD) from Betty’s estate to Jack in order to meet his spending needs and taxes. **Show** your calculations.

4 minutes (Answer Question 7-A on page 40)

Betty’s son, Ryan, works for the local university as an academic advisor. He enjoys an extravagant lifestyle, as Betty provides for his spending needs beyond his salary. Betty states that she will stop providing ongoing support and instead make an immediate one-time gift to Ryan. His goals are to maintain his lifestyle, cover his daughters’ university expenses starting next year, and retire in four years. Betty asks Tuggle to estimate the amount of the gift that would cover gift taxes and allow Ryan to achieve his goals. Tuggle will serve as Ryan’s financial advisor and gathers the following information from Ryan:

- Until retirement, Ryan’s annual after-tax salary will be USD 30,000 and his annual spending needs will be USD 200,000.
- Combined annual cost of education for the twins is USD 190,000 for each of the next four years, and the first payment is due in a year.
- Ryan has no savings.
Tuggle determines that Betty’s gift to Ryan could be invested in a portfolio expected to earn a before-tax rate of return of 8% per year for the next four years. When Ryan retires in four years, he will need an investment portfolio valued at USD 5,000,000 to maintain his lifestyle in retirement. Ryan’s investment returns will be taxed at 25% annually.

B. **Calculate** the amount (in USD) of the one-time gift, before gift taxes, that must be transferred from Betty’s assets to Ryan to allow him to achieve his goals.

Note: Assume that salaries and ongoing expenses are end-of-year cash flows.

6 minutes *(Answer Question 7-B on page 41)*

After the assets are transferred from Betty to Ryan, Tuggle prepares Ryan’s IPS.

C. **Identify** one factor that decreases and one factor that increases Ryan’s ability to take risk.

4 minutes *(Answer Question 7-C on page 42)*

D. **Formulate** each of the following constraints for Ryan’s IPS:

i. Time horizon
ii. Liquidity

Note: Ignore gift taxes for purposes of the liquidity constraint.

4 minutes *(Answer Question 7-D on page 43)*
7-A. Calculate the minimum bequest (in USD) from Betty’s estate to Jack in order to meet his spending needs and taxes. Show your calculations.
7-B. **Calculate** the amount (in USD) of the one-time gift, before gift taxes, that must be transferred from Betty’s assets to Ryan to allow him to achieve his goals.

Note: Assume that salaries and ongoing expenses are end-of-year cash flows.
7-C. Identify one factor that decreases and one factor that increases Ryan’s ability to take risk.
Answer Question 7-D on This Page

7-D. **Formulate each** of the following constraints for Ryan’s IPS:

i. **Time horizon**

ii. **Liquidity**

   Note: Ignore gift taxes for purposes of the liquidity constraint.
Questions 7 and 8 relate to the Betty Friesen family. A total of 34 minutes is allocated to these questions. Candidates should answer these questions in the order presented.

QUESTION 8 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 16 MINUTES.

Twenty-five years have passed and Ryan Smith is now 67 years old. He is currently meeting with his new financial advisor, Tanya Hamilton. Ryan’s 43-year-old twin daughters, Debra and Kelly, are both married with children. He is planning to give his daughters annual cash gifts for the next several years.

Ryan’s retirement portfolio consists of 60% equities and 40% fixed income, and he withdraws funds from the portfolio to meet his cash flow needs in retirement. Ryan asks Hamilton if he should make any changes to his portfolio as a result of his gifting plan. Hamilton recommends substantially increasing the portfolio’s allocation to fixed income.

A. **Determine** whether implementing Hamilton’s recommendation would *most likely* decrease, not change, or increase Ryan’s:

   i. financial market risk.
   ii. longevity risk.

   **Justify each response.**

   6 minutes (Answer Question 8-A on page 46)

Ryan is concerned about the performance of his portfolio due to a current low interest rate environment and expectations of rising inflation. Ryan tells Hamilton that he recently read an article in a personal finance magazine about annuities that pay a lifetime income stream. Hamilton explains to Ryan that an immediate fixed annuity with a non-trade-out provision would provide lifetime income and could be a possible alternative to his current portfolio. Ryan considers converting his entire portfolio to this annuity.

B. **Discuss**, using *only* the information provided, *two* reasons why investing entirely in the immediate fixed annuity might not be appropriate for Ryan.

   4 minutes (Answer Question 8-B on page 47)

Later in his meeting with Hamilton, Ryan shares a concern that his daughters do not have enough life insurance. Both daughters are in good health. Hamilton explains to Ryan the role of human capital in assessing a person’s life insurance needs. Ryan provides the following information about his daughters:

- Debra works for a publicly traded financial services company. In addition to her salary, she receives an annual bonus that is directly related to the performance of her company’s equity. Although volatile, her total compensation averages USD 100,000 per year. Debra has an investment portfolio valued at USD 200,000.
Kelly works for the local city government. She earns USD 75,000 per year. Her job is secure and her salary is stable. Kelly’s investment portfolio is valued at USD 500,000.

C. **Identify one** factor that indicates Debra needs:

i. *less* life insurance than Kelly.

ii. *more* life insurance than Kelly.

**Justify each** response.

6 minutes *(Answer Question 8-C on page 48)*
### Answer Question 8-A on This Page

<table>
<thead>
<tr>
<th>Risk</th>
<th>Determine whether implementing Hamilton’s recommendation would <em>most likely</em> decrease, not change, or increase Ryan’s risk. (circle one)</th>
<th>Justify each response.</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. financial market risk</td>
<td>decrease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>not change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>increase</td>
<td></td>
</tr>
<tr>
<td>ii. longevity risk</td>
<td>decrease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>not change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>increase</td>
<td></td>
</tr>
</tbody>
</table>
8-B. Discuss, using only the information provided, two reasons why investing entirely in the immediate fixed annuity might not be appropriate for Ryan.
8-C. Identify one factor that indicates Debra needs: (see i. and ii. below)
Justify each response.

i. less life insurance than Kelly.

ii. more life insurance than Kelly.
QUESTION 9 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 15 MINUTES.

Michael Delaney, Chief Investment Officer for investment management firm Gulf & Co., is developing a new mutual fund that invests only in US-based technology companies. The fund will be an actively managed, concentrated equity portfolio with a bias toward small-cap stocks. The minimum and maximum position sizes will be 3% and 5% of the portfolio, respectively.

Delaney would like to use a market sector index that is representative of its portfolio as the benchmark. The US technology sector is currently dominated by a few very large-capitalization companies. Additionally, several companies in the sector have very high per-share prices. Delaney believes the sector is undervalued.

Delaney considers two market sector indexes for the benchmark, one capitalization-weighted and the other equal-weighted. Both are US-only, all-capitalization technology sector indexes with similar constituent stocks. Delaney chooses the equal-weighted sector index.

A. **Support**, with two reasons, Delaney’s choice of the equal-weighted index as a benchmark rather than the capitalization-weighted index, based only on the information provided.

4 minutes (Answer Question 9-A on page 52)

Pete Aron, portfolio manager for Gulf & Co.’s European technology fund, is concerned about currency fluctuations related to the equity portfolio (the Portfolio). The Portfolio is valued in USD, but has exposure to multiple European currencies, primarily the EUR.

Aron formulates the following market expectations for the coming year:

- Expected return (in EUR) of the Portfolio: +13.2%
- Standard deviation (in EUR) of the Portfolio: 15%
- Expected USD/EUR spot rate in one year: 1.2045 (1 EUR = 1.2045 USD)
- Standard deviation of the USD/EUR exchange rate: 5%
- Correlation between the USD/EUR exchange rate and the Portfolio (in EUR): −0.07

The market quotes presented in Exhibit 1 are available from a currency dealer:

<table>
<thead>
<tr>
<th>Exhibit 1</th>
<th>Select Market Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD/EUR spot rate</td>
<td>1.1930</td>
</tr>
<tr>
<td>1-year USD/EUR forward rate (bid–offer)</td>
<td>1.2065 – 1.2090</td>
</tr>
</tbody>
</table>
Aron considers selling EUR and buying USD using a one-year forward contract to fully hedge the EUR currency risk. He will execute the trade if he can achieve the following risk/return objectives:

**Objective 1:** Increase the Portfolio’s expected return (in USD) by at least 25 basis points.

**Objective 2:** Reduce the Portfolio’s expected standard deviation (in USD) by at least 30 basis points.

**B. Determine,** based on Aron’s market expectations, whether he should execute the forward trade with respect to *each* of the following:

i. Objective 1
ii. Objective 2

**Justify** your response. **Show** your calculations.

Note: Assume a one-year time horizon. Consider *each* objective independently.

6 minutes (*Answer Question 9-B on page 53*)

One of the non-EUR currency exposures in the Portfolio is GBP. Aron frequently adjusts his GBP positions based on his short-term tactical outlook. Aron forecasts that the GBP will appreciate by 5% against the USD over the next six months. The current USD/GBP rate is 1.60 (1 GBP = 1.60 USD). Aron is considering the following six-month European option positions with the primary objective of increasing his GBP exposure in line with his forecast, and a secondary objective of minimizing the initial cash outlay:

**Trade 1:**
- Buy call with 1.68 strike
- Sell call with 1.72 strike

**Trade 2:**
- Buy call with 1.60 strike
- Sell call with 1.68 strike

**Trade 3:**
- Buy call with 1.60 strike
- Sell call with 1.72 strike

C. **Determine** the trade that will *most likely* satisfy Aron’s objectives at expiration. **Justify** your response.

5 minutes (*Answer Question 9-C on page 54*)
9-A. Support, with two reasons, Delaney’s choice of the equal-weighted index as a benchmark rather than the capitalization-weighted index, based only on the information provided.
Answer Question 9-B on This Page

9-B. **Determine**, based on Aron’s market expectations, whether he should execute the forward trade with respect to *each* Objective. **Justify** your response. **Show** your calculations.

Note: Assume a one-year time horizon. Consider *each* objective independently.

i. Objective 1.

ii. Objective 2.
9-C. **Determine** the trade that will *most likely* satisfy Aron’s objectives at expiration. **Justify** your response.
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MARKS MADE ON THIS PAGE ARE NOT GRADED
QUESTION 10 HAS THREE PARTS (A, B, C) FOR A TOTAL OF 14 MINUTES.

Conner Young is an economist at a multi-strategy asset management firm. Each year, he provides his firm with a report that includes a series of market forecasts. As part of his report, Young uses the Grinold-Kroner model to forecast the expected rate of return on equities for the next 10 years. He uses the data in Exhibit 1 to prepare his forecast.

Exhibit 1
Young’s Market Forecast

<table>
<thead>
<tr>
<th>Factor</th>
<th>10-Year Forecast (annualized)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dividend yield</td>
<td>1.80%</td>
</tr>
<tr>
<td>Dividend growth rate</td>
<td>4.00%</td>
</tr>
<tr>
<td>Change in P/E multiple</td>
<td>0.50%</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>1.20%</td>
</tr>
<tr>
<td>Change in number of shares outstanding</td>
<td>-0.30%</td>
</tr>
<tr>
<td>Real total earnings growth rate</td>
<td>2.50%</td>
</tr>
</tbody>
</table>

A. **Determine** the following sources of return for equities, according to the Grinold-Kroner model, using Young’s forecasts:

i. Expected nominal earnings growth return
ii. Expected repricing return
iii. Expected income return

**Show** any calculations.

6 minutes (Answer Question 10-A on page 58)

Young also reviews the central bank’s current monetary policy. He uses the data in Exhibit 2 and the Taylor rule to determine whether the central bank is likely to change its target short-term interest rate. The neutral short-term interest rate is equal to the central bank’s current target rate.

Exhibit 2
Economic Data and Central Bank Forecasts

<table>
<thead>
<tr>
<th>Economic Data and Central Bank Forecasts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target inflation rate</td>
</tr>
<tr>
<td>Forecast inflation rate</td>
</tr>
<tr>
<td>Inflation rate (last 12 months)</td>
</tr>
<tr>
<td>Neutral short-term interest rate</td>
</tr>
<tr>
<td>Real GDP trend growth rate</td>
</tr>
<tr>
<td>Real GDP forecast growth rate</td>
</tr>
</tbody>
</table>

B. **Determine** whether the central bank should loosen or tighten monetary policy, assuming it follows the Taylor rule. **Justify** your response. **Show** your calculations.

4 minutes (Answer Question 10-B on page 59)
One year later, Young meets with his firm’s fixed income portfolio manager, Bianca Dvorak. Dvorak manages a domestic bond fund for the firm and is considering whether to purchase a 5-year callable, BBB-rated corporate bond for the fund. The corporate bond currently yields 4.90%.

Dvorak wants to use the risk premium approach to decide whether to purchase the bond for her fund. The trailing 12-month inflation rate is 1.10% and Young expects inflation to be constant at 1.50% per year for the next five years. Dvorak assumes that the illiquidity discount and tax premium are both zero. Dvorak and Young compile the information in Exhibit 3.

<table>
<thead>
<tr>
<th>Exhibit 3</th>
<th>Domestic Bond Market Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real risk-free interest rate</td>
<td>1.30%</td>
</tr>
<tr>
<td>1-year BBB-rated credit risk spread (over Treasuries)</td>
<td>30 basis points</td>
</tr>
<tr>
<td>5-year BBB-rated credit risk spread (over Treasuries)</td>
<td>80 basis points</td>
</tr>
<tr>
<td>Spread of 5-year Treasury over 1-year Treasury</td>
<td>100 basis points</td>
</tr>
<tr>
<td>1-year call risk spread</td>
<td>20 basis points</td>
</tr>
<tr>
<td>5-year call risk spread</td>
<td>60 basis points</td>
</tr>
</tbody>
</table>

C. **Determine**, based on the risk premium approach, whether Dvorak should purchase the corporate bond. **Justify** your response. **Show** your calculations.

4 minutes (Answer Question 10-C on page 60)
10-A. **Determine** the following sources of return for equities, according to the Grinold-Kroner model, using Young’s forecasts: (see i. and ii. below) **Show** any calculations.

i. Expected nominal earnings growth return.

ii. Expected repricing return.

iii. Expected income return.
10-B. **Determine** whether the central bank should loosen or tighten monetary policy, assuming it follows the Taylor rule. **Justify** your response. **Show** your calculations.
10-C. **Determine**, based on the risk premium approach, whether Dvorak should purchase the corporate bond. **Justify** your response. **Show** your calculations.
Pablo Rodriquez is an advisor at a brokerage firm with retail clients who are active traders. He acquires four clients from Carla Chee, an advisor who is retiring from the firm. Over the years, Chee regularly surveyed her clients to detect any behavioral biases in their investment decision-making processes. She determined that her clients routinely exhibited the biases summarized in Exhibit 1.

<table>
<thead>
<tr>
<th>Chee Clients: Behavioral Biases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Client 1</td>
</tr>
<tr>
<td>Client 2</td>
</tr>
<tr>
<td>Client 3</td>
</tr>
<tr>
<td>Client 4</td>
</tr>
</tbody>
</table>

Rodriquez believes that clients act primarily on the basis of their biases. He meets with the clients to evaluate Chee’s assessments of their biases.

**Client 1 and Client 2:**
Rodriquez asks Client 1 and Client 2 to consider two equities, Uno Inc. and Deux Co., which each had purchased for their respective portfolios. The purchase price and current price are shown in Exhibit 2. Neither equity pays dividends.

<table>
<thead>
<tr>
<th>Selected Equity Holdings (in USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Uno Inc.</td>
</tr>
<tr>
<td>Deux Co.</td>
</tr>
</tbody>
</table>

**A. Determine**, assuming Chee’s bias assessments are correct, which action (buy additional shares, take no action, sell) *each* client will *most likely* choose for *each* of the following equities:

i. Uno Inc.
ii. Deux Co.

*Justify each* response.

Note: Consider *each* client (Client 1 and Client 2) and *each* equity independently.

12 minutes (Answer Question 11-A on page 64)
Client 3:
Client 3 has a preference for only spending the income earned by her portfolio, which is currently allocated 100% to fixed income investments. Rodriguez suggests that she consider changing to a balanced portfolio by adding equities to her existing portfolio. He informs her that the total return from the balanced portfolio should permit her to increase withdrawals from the portfolio without diminishing the real value of her principal. Rodriguez shares with Client 3 the expectations for her current portfolio and the proposed portfolio, shown in Exhibit 3.

### Exhibit 3

**Investment Portfolio Expectations**

<table>
<thead>
<tr>
<th>Portfolio Allocation Option</th>
<th>Income</th>
<th>Capital Appreciation</th>
<th>Total Return</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed income portfolio (current)</td>
<td>4.2%</td>
<td>0.0%</td>
<td>4.2%</td>
<td>6.5%</td>
</tr>
<tr>
<td>Balanced portfolio (proposed)</td>
<td>3.0%</td>
<td>3.1%</td>
<td>6.1%</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

B. **Determine**, assuming Chee’s bias assessment is correct, which portfolio Client 3 would most likely prefer. **Justify** your response.

3 minutes (Answer Question 11-B on page 65)

Client 4:
Client 4 has a history of selecting low-volatility equities and government bonds for his portfolio. Rodriguez presents him with two potential investments for his portfolio. He tells the client that:

- Investment Y has a 20% chance of incurring a loss.
- Investment Z has an 80% chance of not incurring a loss.
- Both investments have the same expected return.

Rodriguez asks Client 4 which investment he would prefer for his portfolio.

C. **Determine**, assuming Chee’s bias assessment is correct, which investment (Y or Z) Client 4 would most likely prefer. **Justify** your response.

3 minutes (Answer Question 11-C on page 66)
### Answer Question 11-A on This Page

Note: Consider *each* client (Client 1 and Client 2) and *each* equity independently.

<table>
<thead>
<tr>
<th>Client (Bias)</th>
<th>Equity</th>
<th>Determine, assuming Chee’s bias assessments are correct, which action <em>each</em> client will most likely choose for <em>each</em> of the following equities. (circle one)</th>
<th>Justify <em>each</em> response.</th>
</tr>
</thead>
</table>
| Client 1 (Regret-aversion) | Uno Inc. | buy additional shares  
take no action  
sell |  |
|                     | Deux Co. | buy additional shares  
take no action  
sell |  |
| Client 2 (Loss-aversion) | Uno Inc. | buy additional shares  
take no action  
sell |  |
|                     | Deux Co. | buy additional shares  
take no action  
sell |  |
11-B. Determine, assuming Chee’s bias assessment is correct, which portfolio Client 3 would most likely prefer. Justify your response.
Answer Question 11-C on This Page

11-C. Determine, assuming Chee’s bias assessment is correct, which investment (Y or Z) Client 4 would most likely prefer. Justify your response.
LEVEL III

Question: 1
Topic: Institutional PM
Minutes: 14

Reading References:
#14 “Managing Institutional Investor Portfolios,” by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors

Reading #14 LOS:
The candidate should be able to:

a. contrast a defined-benefit plan to a defined-contribution plan and discuss the advantages and disadvantages of each from the perspectives of the employee and the employer;

b. discuss investment objectives and constraints for defined-benefit plans;

c. evaluate pension fund risk tolerance when risk is considered from the perspective of the 1) plan surplus, 2) sponsor financial status and profitability, 3) sponsor and pension fund common risk exposures, 4) plan features, and 5) workforce characteristics;

d. prepare an investment policy statement for a defined-benefit plan;

e. evaluate the risk management considerations in investing pension plan assets;

f. prepare an investment policy statement for a participant directed defined-contribution plan;

g. discuss hybrid pension plans (e.g., cash balance plans) and employee stock ownership plans;

h. distinguish among various types of foundations, with respect to their description, purpose, and source of funds;

i. compare the investment objectives and constraints of foundations, endowments, insurance companies, and banks;

j. discuss the factors that determine investment policy for pension funds, foundation endowments, life and non-life insurance companies, and banks;

k. prepare an investment policy statement for a foundation, an endowment, an insurance company, and a bank;

l. contrast investment companies, commodity pools, and hedge funds to other types of institutional investors;

m. compare the asset/liability management needs of pension funds, foundations, endowments, insurance companies, and banks;

n. compare the investment objectives and constraints of institutional investors given relevant data, such as descriptions of their financial circumstances and attitudes toward risk.
Guideline Answer:

Part A

The risk tolerance of the Plan is above-average for the following reasons:

1. Saylor is usually highly profitable. High expected profitability supports above average (AA) risk tolerance because the impact of unfavorable investment returns can be mitigated by the ability to increase Plan contributions. Saylor’s past high profitability is expected to resume in the future.

2. Saylor has a young workforce, which implies a long duration of Plan liabilities. This allows for an AA risk tolerance due to low liquidity requirements and a longer time to make up funding shortfalls.

3. Saylor has no current pension recipients, which increases the duration of Plan liabilities. This allows for AA risk tolerance due to low liquidity requirements and a longer time to make up funding shortfalls.

4. Saylor’s return on Plan assets has a low correlation with both the broad equity market and the company’s operating results because the company is cyclical. The low correlation between Saylor’s operating results and Plan asset returns allows for AA risk tolerance. The Plan can seek higher asset returns; there is low probability that unfavorable returns will coincide with poor operating performance.

5. The absence of an early retirement provision increases the duration of Plan liabilities and allows for AA risk tolerance due to lower liquidity requirements and a longer time to make up funding shortfalls.

Note that there are two factors that could support below-average risk tolerance. First is the recent decline in profitability and elimination of the funding surplus (Saylor is a cyclical company). However, declining profitability is expected to be reversed in the near future. Second is a higher debt-to-assets ratio of 0.42 relative to the industry average of 0.40. This is a very minor differential, and the impact is mitigated by the fact that the company is usually highly profitable.
Part B

The minimum return requirement is the rate that equates the present value of the Plan’s liabilities with the value of the Plan’s assets. This rate is the discount rate, 4.5%.

The explanation as to why this is the minimum return requirement is that the Plan is exactly fully funded. If the Plan’s assets earn a return equal to the discount rate used to compute the present value of its liabilities, then Plan assets should be exactly sufficient to pay for the liabilities as they come due.

Part C

i. By offering an early retirement option with a lump-sum payment, the liquidity requirement would increase. The liquidity requirement is currently low because there are no pension recipients and, given the low average age of the workforce, no significant cash outflows from the Plan are expected in the near term. However, once the early retirement option is introduced, this increases the liquidity requirement for the Plan because 10% of the workforce accepted the option and will now receive a lump-sum payment within one year.

ii. By offering an early retirement option with a lump-sum payment, the weighted average duration of Plan liabilities is reduced. Prior to the introduction of this option, payments to retirees would have been made over the course of many years in the future. However, with the early retirement option, for that 10% of the workforce who selected this option, these far-dated liabilities will now be paid out of the Plan through a lump sum payable in one year. The liability duration for this 10% of the workforce has thus declined. This means that at the time the early retirement option is introduced, the weighted average duration of Plan liabilities has declined.
LEVEL III

Question: 2
Topic: Institutional PM
Minutes: 17

Reading References:
#14 “Managing Institutional Investor Portfolios,” by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors
#15 “Linking Pension Liabilities to Assets,” by Aaron Meder and Renato Staub

Reading #14 LOS:
The candidate should be able to:

a. contrast a defined-benefit plan to a defined-contribution plan and discuss the advantages and disadvantages of each from the perspectives of the employee and the employer;
b. discuss investment objectives and constraints for defined-benefit plans;
c. evaluate pension fund risk tolerance when risk is considered from the perspective of the 1) plan surplus, 2) sponsor financial status and profitability, 3) sponsor and pension fund common risk exposures, 4) plan features, and 5) workforce characteristics;
d. prepare an investment policy statement for a defined-benefit plan;
e. evaluate the risk management considerations in investing pension plan assets;
f. prepare an investment policy statement for a participant directed defined-contribution plan;
g. discuss hybrid pension plans (e.g., cash balance plans) and employee stock ownership plans;
h. distinguish among various types of foundations, with respect to their description, purpose, and source of funds;
i. compare the investment objectives and constraints of foundations, endowments, insurance companies, and banks;
j. discuss the factors that determine investment policy for pension funds, foundation endowments, life and non-life insurance companies, and banks;
k. prepare an investment policy statement for a foundation, an endowment, an insurance company, and a bank;
l. contrast investment companies, commodity pools, and hedge funds to other types of institutional investors;
m. compare the asset/liability management needs of pension funds, foundations, endowments, insurance companies, and banks;
n. compare the investment objectives and constraints of institutional investors given relevant data, such as descriptions of their financial circumstances and attitudes toward risk.

Reading #15 LOS:
The candidate should be able to:

a. contrast the assumptions concerning pension liability risk in asset-only and liability-relative approaches to asset allocation;
b. discuss the fundamental and economic exposures of pension liabilities and identify asset types that mimic these liability exposures;
c. compare pension portfolios built from a traditional asset-only perspective to portfolios designed relative to liabilities and discuss why corporations may choose not to implement fully the liability mimicking portfolio.
Guideline Answer:

Part A

Measuring risk relative to liabilities requires modeling of the liability and understanding its market-related exposures.

i. Nayar’s asset-only approach implicitly assumes that the liability has no risk. By contrast, the liability-relative approach focuses on exposure to factors that affect the present value of pension liabilities such as term structure, inflation, and productivity growth.

ii. Nayar’s asset-only approach considers a low-risk pension investment as one having low correlation with the portfolio’s existing assets. By contrast, the liability-relative approach views the low-risk investment as having high correlation with the pension liability.

Part B

Nayar should include real rate (inflation indexed) bonds in the Plan’s asset allocation. Because wages are growing with inflation and retirement benefits are indexed to inflation, the liability stream is sensitive to inflation. Shifting a portion of the allocation from nominal bonds to real rate bonds would be consistent with the liability-relative approach.

Nayar should also increase the allocation to equities. Given the young age of the workforce, long average time until retirement, and high proportion of future wage growth expected to come from productivity growth, a larger allocation to equities is appropriate. Shifting a portion of the allocation from nominal bonds to equities would be consistent with the liability-relative approach because real wage growth is correlated with economic growth and equity returns.
Determine whether the Foundation’s ability to take risk is lower than, equal to, or higher than that of the Saylor pension plan. (circle one)

<table>
<thead>
<tr>
<th>Justify your response with <em>two reasons</em>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>lower than</td>
</tr>
<tr>
<td>1. The pension plan has a contractually required liability stream, whereas the community foundation does not, which means that the liquidity needs for the foundation are low. The Foundation has the ability to adjust the distribution, which allows them to assume a higher level of risk than the pension fund.</td>
</tr>
<tr>
<td>equal to</td>
</tr>
<tr>
<td>2. The time horizon of the community foundation is theoretically infinite because it has no contractual liabilities and is intended to operate in perpetuity, which affords it more time to recoup losses. The pension plan has shorter liability duration due to the need to pay benefits to retired employees. Longer liability duration increases ability to take risk.</td>
</tr>
<tr>
<td>higher than</td>
</tr>
<tr>
<td>Note: The board’s instruction to be conservative indicates a lower <em>willingness</em> to take risk and does not affect the Foundation’s ability to take risk.</td>
</tr>
</tbody>
</table>
Reading References:

Reading #21 LOS:
The candidate should be able to:
  a. compare, with respect to investment objectives, the use of liabilities as a benchmark and the use of a bond index as a benchmark;
  b. compare pure bond indexing, enhanced indexing, and active investing with respect to the objectives, advantages, disadvantages, and management of each;
  c. discuss the criteria for selecting a benchmark bond index and justify the selection of a specific index when given a description of an investor’s risk aversion, income needs, and liabilities;
  d. critique the use of bond market indexes as benchmarks;
  e. **describe and evaluate techniques, such as duration matching and the use of key rate durations, by which an enhanced indexer may seek to align the risk exposures of the portfolio with those of the benchmark bond index;**
  f. **contrast and demonstrate the use of total return analysis and scenario analysis to assess the risk and return characteristics of a proposed trade;**
  g. formulate a bond immunization strategy to ensure funding of a predetermined liability and evaluate the strategy under various interest rate scenarios;
  h. demonstrate the process of rebalancing a portfolio to reestablish a desired dollar duration;
  i. explain the importance of spread duration;
  j. discuss the extensions that have been made to classical immunization theory, including the introduction of contingent immunization;
  k. explain the risks associated with managing a portfolio against a liability structure, including interest rate risk, contingent claim risk, and cap risk;
  l. compare immunization strategies for a single liability, multiple liabilities, and general cash flows;
  m. compare risk minimization with return maximization in immunized portfolios;
  n. demonstrate the use of cash flow matching to fund a fixed set of future liabilities and compare the advantages and disadvantages of cash flow matching to those of immunization strategies.

Reading #22 LOS:
The candidate should be able to:
  a. explain classic relative-value analysis, based on top-down and bottom-up approaches to credit bond portfolio management;
b. discuss the implications of cyclical supply and demand changes in the primary corporate bond market and the impact of secular changes in the market’s dominant product structures;

c. explain the influence of investors’ short- and long-term liquidity needs on portfolio management decisions;

d. discuss common rationales for secondary market trading;

e. discuss corporate bond portfolio strategies that are based on relative value.
Guideline Answer:

Part A

Effective duration measures the sensitivity of a portfolio’s price to a small parallel shift in the yield curve (interest rate risk). For a larger parallel shift, a convexity adjustment is used to improve the accuracy of the estimated price change. Key rate duration captures non-parallel shifts (yield curve risk) such as a steepening in slope or a twist in the yield curve. It measures the effect of changes at key points along the yield curve.

i. Optima does not violate its mandate in Scenario 1. Optima and its benchmark exhibit the same price sensitivity to a small parallel shift in the yield curve because Optima is matched on effective duration.

ii. Optima does not violate its mandate in Scenario 2. Optima and its benchmark exhibit different price sensitivities to a non-parallel shift in the yield curve, indicating that Optima is not matched on key rate duration at the 5-year spot rate. However, its mandate does not require that it be matched on key rate duration.

Part B

Blanc should not implement the proposed trade. As credit spreads narrow and yields experience a downward parallel shift, corporate callable bonds trading at par underperform corporate non-callable bonds of the same maturity and credit quality. This occurs because callable bonds have shorter duration, lower (possibly negative) convexity and higher probability of call exercise.
### Part C

#### Template for Question 3-C

Note: Ignore transaction costs and assume volatility is constant.

<table>
<thead>
<tr>
<th>Trade</th>
<th>Determine the expected effect (negative, no effect, or positive) on Intrepid’s performance from each of the following trades, assuming Blanc’s forecasts are realized. (circle one)</th>
<th>Justify each response with one reason.</th>
</tr>
</thead>
</table>
| i. Trade 1 | negative  
no effect  
positive | This is a classic crossover trade where managers seek bonds of the highest speculative grade rating (Ba1/BB+) that are likely to benefit from an upgrade as the economy strengthens. The potential impact of an upgrade is more significant for lower quality bonds.  
Intrepid should benefit from a potential credit upgrade and increased liquidity (higher demand) of the 10-year Ba1/BB+ consumer cyclical sector bond. |
| ii. Trade 2 | negative  
no effect  
positive | In anticipation of an upward parallel shift in the yield curve, the duration of the fund should be reduced to lessen the impact of a price decline. The higher the coupon rate, the shorter the duration will be (all else equal), and the less sensitive the price will be to changes in interest rates.  
Shifting to a bond with a higher coupon, all else equal, will result in a shorter duration for Intrepid. The shorter duration leads to a less price sensitive portfolio. If rates increase, this results in a higher return. |
Part D

Mean-reversion analysis assumes that the spread will revert back to its historical average. This would lead investors to a) buy a bond identified as cheap because the spread has been tighter in the past than it is currently and is expected to tighten; b) sell a bond identified as rich because the spread has been wider in the past than it is currently and is expected to widen.

To assess whether the current deviation from the mean credit spread is significant, the bonds can be ranked using the following formula:

\[
\frac{\text{Current spread} - \text{Historical mean spread}}{\text{Standard deviation spread}}
\]

The number of standard deviations above the mean for each of the three bonds is:

- Aries: \( \frac{300 - 210}{50} = 1.8 \)
- Libra: \( \frac{320 - 230}{30} = 3.0 \)
- Taurus: \( \frac{340 - 240}{40} = 2.5 \)

Libra is the most appropriate bond to purchase because its credit spread is the largest number of standard deviations above its mean. Libra’s spread is more likely to contract than the spreads on the other two bonds. This calculation helps the manager determine the cheapest bond, while also accounting for volatility.
LEVEL III

Question: 4
Topic: Alternative Investments
Minutes: 20

Reading References:

Reading #25 LOS:
The candidate should be able to:

a. describe common features of alternative investments and their markets and how alternative investments may be grouped by the role they typically play in a portfolio;
b. explain and justify the major due diligence checkpoints involved in selecting active managers of alternative investments;
c. explain distinctive issues that alternative investments raise for investment advisers of private wealth clients;
d. distinguish among the principal classes of alternative investments, including real estate, private equity, commodity investments, hedge funds, managed futures, buyout funds, infrastructure funds, and distressed securities;
e. discuss the construction and interpretation of benchmarks and the problem of benchmark bias in alternative investment groups;
f. evaluate the return enhancement and/or risk diversification effects of adding an alternative investment to a reference portfolio (for example, a portfolio invested solely in common equity and bonds);
g. describe advantages and disadvantages of direct equity investments in real estate;
h. discuss the major issuers and suppliers of venture capital, the stages through which private companies pass (seed stage through exit), the characteristic sources of financing at each stage, and the purpose of such financing;
i. compare venture capital funds and buyout funds;
j. discuss the use of convertible preferred stock in direct venture capital investment;
k. explain the typical structure of a private equity fund, including the compensation to the fund’s sponsor (general partner) and typical timelines;
l. discuss issues that must be addressed in formulating a private equity investment strategy;
m. compare indirect and direct commodity investment;
n. explain the three components of return for a commodity futures contract and the effect that an upward- or downward-sloping term structure of futures prices will have on roll yield;
o. describe the principal roles suggested for commodities in a portfolio and explain why some commodity classes may provide a better hedge against inflation than others;
p. identify and explain the style classification of a hedge fund, given a description of its investment strategy;
q. discuss the typical structure of a hedge fund, including the fee structure, and explain the rationale for high-water mark provisions;
r. describe the purpose and characteristics of fund-of-funds hedge funds;
s. discuss concerns involved in hedge fund performance evaluation;
t. describe trading strategies of managed futures programs and the role of managed futures in a portfolio;

u. describe strategies and risks associated with investing in distressed securities;

v. explain event risk, market liquidity risk, market risk, and “J-factor risk” in relation to investing in distressed securities.
Guideline Answer:

Part A

The unsmoothed NCREIF Index is the most appropriate index to represent the expected characteristics of Vizyon’s proposed investment in real estate. The unsmoothing corrects for biases in the NCREIF index such as infrequent appraisal-based valuations, making the NCREIF (unsmoothed) reflect the true underlying characteristics (and higher) volatility and correlations with other assets in the portfolio.

The other indices are not the most appropriate to use for the following reasons:

1. Using the NCREIF Index (unadjusted) overstates the benefits of allocating assets to direct real estate. The NCREIF Index is based on infrequent appraisal-based property values and therefore tends to underestimate both the volatility in market value and the correlation with other asset classes (thus showing an inflated Sharpe ratio).

2. The NAREIT Index (whether hedged or unhedged) is used as a benchmark for indirect (securitized) real estate investments and is thus not applicable to direct real estate investments.

3. The Sharpe ratio level is not relevant for determining which real estate index is most appropriate to represent the portfolio’s characteristics.

Part B

The disadvantages of a direct investment in the shopping center relative to the publicly traded equity investment in the hotel chain are as follows:

1. Higher transaction cost. Buying the shopping center would incur a 7.8% transaction cost (USD 18 million/USD 230 million), significantly higher than the commission charged when trading public securities. Buying a portion of the hotel chain would incur a transaction cost of only 0.18%, equivalent to approximately USD 0.4 million.

2. Higher cost of acquiring information. The shopping center has been privately owned by the original owner since inception. Therefore, information about the asset is likely to be difficult to obtain and thus could be expensive to acquire. The hotel chain has been publicly listed on the New York Stock Exchange for 10 years. Therefore, the cost of obtaining relevant information about the asset is low.

3. Relative lack of liquidity. The shopping center represents a direct (physical) investment in real estate and these tend to be much less liquid than publicly-traded companies. The shopping center
had the same owner for 7 years and is almost certainly less liquid than the hotel chain that is publicly listed on the New York Stock Exchange.

4. Higher geographical diversification risk. The shopping center is a single property in a single location. Compared to a real estate investment with properties located at multiple locations, the shopping center investment is more exposed to specific (non-systematic or idiosyncratic) risks such as natural catastrophe risk and neighborhood deterioration risk, and thus lacks diversification benefits. The hotel chain has locations across the U.S. and is therefore better diversified geographically. Even if one of the locations for the hotel chain were to deteriorate, the diversified nature of the investment would mitigate a fall in value.

Part C

The performance fee for the three months from June to August is USD 24 per unit of the fund.

The high-water mark provision means that performance fees are charged only when the fund surpasses the high-water mark and thus sets a new high-water mark. Therefore, the correct performance fee for the three month period is 15% × (USD 3,260 – USD 3,100) = USD 24 per unit of the fund.

The fund cannot charge a performance fee for July or August because the month-end NAV’s in July (USD 2,900) and in August (USD 3,140) were below the applicable high-water mark (USD 3,260) set at the end of June.

Part D

Khepri Capital is subject to J-factor risk (“judge” factor risk) because the distressed debt fund has 14% of its NAV exposed to an investment in a distressed automotive company which has filed for bankruptcy. This means that Khepri Capital’s investment outcome will depend significantly on the judge’s ruling in the automotive company’s case.

Part E

Khepri is a newly-formed fund. Having a 3-year investment horizon for the distressed debt investment, Vizyon will benefit from Khepri Capital’s matching 3-year lock-up period because it prevents other investors with shorter time horizons from withdrawing their capital early, which could potentially reduce Khepri Capital’s overall return.
Reading References:
#32 “Evaluating Portfolio Performance,” by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors

Reading #32 LOS:
The candidate should be able to:

a. demonstrate the importance of performance evaluation from the perspective of fund sponsors and the perspective of investment managers;

b. explain the following components of portfolio evaluation: performance measurement, performance attribution, and performance appraisal;

c. calculate, interpret, and contrast time-weighted and money-weighted rates of return and discuss how each is affected by cash contributions and withdrawals;

d. identify and explain potential data quality issues as they relate to calculating rates of return;

e. demonstrate the decomposition of portfolio returns into components attributable to the market, to style, and to active management;

f. discuss the properties of a valid performance benchmark and explain advantages and disadvantages of alternative types of benchmarks;

g. explain the steps involved in constructing a custom security-based benchmark;

h. discuss the validity of using manager universes as benchmarks;

i. evaluate benchmark quality by applying tests of quality to a variety of possible benchmarks;

j. discuss issues that arise when assigning benchmarks to hedge funds;

k. distinguish between macro and micro performance attribution and discuss the inputs typically required for each;

l. demonstrate and contrast the use of macro and micro performance attribution methodologies to identify the sources of investment performance;

m. discuss the use of fundamental factor models in micro performance attribution;

n. evaluate the effects of the external interest rate environment and active management on fixed-income portfolio returns;

o. explain the management factors that contribute to a fixed-income portfolio’s total return and interpret the results of a fixed-income performance attribution analysis;

p. calculate, interpret, and contrast alternative risk-adjusted performance measures, including (in their ex post forms) alpha, information ratio, Treynor measure, Sharpe ratio, and $M^2$;

q. explain how a portfolio’s alpha and beta are incorporated into the information ratio, Treynor measure, and Sharpe ratio;

r. demonstrate the use of performance quality control charts in performance appraisal;

s. discuss the issues involved in manager continuation policy decisions, including the costs of hiring and firing investment managers;

t. contrast Type I and Type II errors in manager continuation decisions.
Guideline Answer:

Part A

The fund outperformed a pure indexing strategy.

The fund would have returned 8.02% with a pure indexing strategy, which is less than the fund’s actual return of 8.14%. The 8.02% is the cumulative return up to the Asset Category level, which results from adding 0.50% (Risk-free Asset return) and 7.52% (incremental return from Asset Category):

\[ 0.50\% + 7.52\% = 8.02\% < 8.14\% \]

The Asset Category investment strategy assumes that the Fund’s beginning value and external cash flows are invested passively in a combination of the designated asset category benchmarks, with the specific allocation to each benchmark based on the fund sponsor’s policy allocations to those asset categories. This is a pure index fund approach.

Part B

i. The fund’s return due to style bias (which is the incremental return from Benchmarks) was equal to 0.14%, or USD 504,000.

ii. The fund’s return due to active management (which is the incremental return from Investment Managers) was equal to 0.08%, or USD 288,000.
Part C

The time-weighted rate of return (TWR) requires that an account be valued every time an external cash flow occurs. When an external cash flow takes place at the end of the evaluation period, the TWR can be calculated as:

\[
\text{TWR} = \left( \frac{MV_1 - CF}{MV_0} \right) - 1
\]

where
- \(MV_0\): beginning market value
- \(MV_1\): ending market value
- \(CF\): external cash flow

If more than one external cash flow takes place, then the TWR requires computing a set of sub-period returns. There are three sub-period returns for Manager A:

**Sub-period 1:**
Days 1-8
\[
r_1 = \frac{(135,000,000 - 13,000,000) - 121,000,000}{121,000,000} = 0.0083
\]

**Sub-period 2:**
Days 9-23
\[
r_2 = \frac{(127,000,000 - (-8,000,000)) - 135,000,000}{135,000,000} = 0
\]

**Sub-period 3:**
Days 24-30
\[
r_3 = \frac{123,000,000 - 127,000,000}{127,000,000} = -0.0315
\]

Adding 1 to the (decimal) rate of return for each sub-period creates a set of wealth relatives (wr):

\[
wr_1 = 1 + r_1 = 1 + 0.0083 = 1.0083
\]
\[
wr_2 = 1 + r_2 = 1 + 0 = 1
\]
\[
wr_3 = 1 + r_3 = 1 + (-0.0315) = 0.9685
\]

The wealth relatives are multiplied together to generate a cumulative wealth relative. Subtracting 1 from the result produces the TWR for Manager A:

\[
\text{TWR} = (wr_1 \times wr_2 \times wr_3) - 1 = (1.0083 \times 1 \times 0.9685) - 1 = 0.9765 - 1 = -0.0235
\]
\[
\text{TWR} = -2.35\%
\]
Part D

i. The pure sector allocation return for Manager B for the Financial sector equals:

\[(\text{Sector portfolio weight} - \text{Sector benchmark weight}) \times (\text{Sector benchmark return} - \text{Overall benchmark return})\]

\[(31.35\% - 11.79\%) \times (4.98\% - 4.01\%) = 0.19\% \text{ or } 19 \text{ bps}\]

The decision to overweight a sector that outperformed the overall benchmark resulted in a positive contribution to the performance of the portfolio relative to the overall benchmark.

ii. The within-sector selection return for Manager B for the Technology sector equals:

\[\text{Sector benchmark weight} \times (\text{Sector portfolio return} - \text{Sector benchmark return})\]

\[14.07\% \times [-9.02\% - (-1.71\%)] = -1.03\% \text{ or } -103 \text{ bps}\]

The portfolio’s Technology equities that in total underperformed the equities in the Technology sector benchmark, resulting in a negative contribution to the performance relative to the overall benchmark.
Reading References:
#26 “Risk Management,” by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors

Reading #26 LOS:
The candidate should be able to:

- a. discuss features of the risk management process, risk governance, risk reduction, and an enterprise risk management system;
- b. evaluate strengths and weaknesses of a company’s risk management process;
- c. describe steps in an effective enterprise risk management system;
- d. evaluate a company’s or a portfolio’s exposures to financial and nonfinancial risk factors;
- e. calculate and interpret value at risk (VAR) and explain its role in measuring overall and individual position market risk;
- f. compare the analytical (variance–covariance), historical, and Monte Carlo methods for estimating VAR and discuss the advantages and disadvantages of each;
- g. discuss advantages and limitations of VAR and its extensions, including cash flow at risk, earnings at risk, and tail value at risk;
- h. compare alternative types of stress testing and discuss advantages and disadvantages of each;
- i. **evaluate the credit risk of an investment position, including forward contract, swap, and option positions**;
- j. demonstrate the use of risk budgeting, position limits, and other methods for managing market risk;
- k. **demonstrate the use of exposure limits, marking to market, collateral, netting arrangements, credit standards, and credit derivatives to manage credit risk**;
- l. discuss the Sharpe ratio, risk-adjusted return on capital, return over maximum drawdown, and the Sortino ratio as measures of risk-adjusted performance;
- m. demonstrate the use of VAR and stress testing in setting capital requirements.
Guideline Answer:

Part A

Interest Rate Swap
The total amount at risk of a credit loss is equal to the current market value of the swap, and is borne by the party with the positive market value, which is Tartan in this case.

Credit risk to Tartan USD 56,000

Forward contract
The total amount at risk of a credit loss is equal to the current market value of the contract, and is borne by the party with the positive market value, which is Tartan’s counterparty in this case.

Credit risk to Tartan USD 0

Option
The total amount at risk of a credit loss is equal to the current market value of the option, and is borne by the party with the positive market value, the option buyer, which is Tartan in this case.

Credit risk to Tartan = USD 487,000

Total amount at risk of credit loss = USD 543,000

Part B

Positive effect:

Payment netting with a single counterparty nets the positive and negative market values of all of the derivative positions into one net gain or loss.

Based on Tartan’s current holdings shown in Exhibit 1, the total amount at risk of credit loss to Tartan would be decreased under payment netting with a single counterparty because the negative value of the forward contract (potential payment to the counterparty) would reduce Tartan’s credit loss in the event of a default. Using the current values, the total amount at risk of credit loss would decrease to USD 318,000 from USD 543,000.

The benefit of payment netting is Tartan’s ability to use the negative value of the forward contract to partially offset the credit risk of the other two contracts.
Negative effect:

Instead of its current policy, which spreads counterparty risk among several companies, Tartan would face concentrated exposure to the default of a single counterparty.

Many risk managers mandate specific maximum exposures to individual counterparties to ensure diversification and limit overall risk, should a counterparty default. Aggregating Tartan’s credit risk with one counterparty would eliminate the benefits of diversification.

Given Tartan’s current positions, the total amount at risk of credit loss would be smaller with a single counterparty than it would be with three different counterparties, but the entire netted position would be at risk in the event of a default by that single counterparty.

Part C

i. Recommendation 1 would achieve Magnuson’s objective of reducing credit risk. Currency swaps have counterparty risk, as they are over-the-counter instruments, whereas currency futures are exchange traded and have little or no counterparty risk because the exchange guarantees fulfillment.

ii. Recommendation 2 would not achieve Magnuson’s objective of reducing credit risk. Credit risk arises from any payments due from one party to the other. Further, credit risk with options is unilateral, meaning that the option holder (buyer) faces all the credit risk and the seller (writer) none. The party that is long the option (buyer) should receive payment from the seller if the option is in the money at expiration. During the life of the option, the buyer will have a positive market value on the option. Thus, the buyer has the credit risk of not receiving a potential payment at expiration. The seller receives a premium upfront but no payments at expiration, and therefore has no credit risk.
LEVEL III

Question: 7  
Topic: Individual PM  
Minutes: 18

Reading References:  
#9 “Managing Individual Investor Portfolios,” by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors  

Reading #9 LOS:  
The candidate should be able to:  
a. discuss how source of wealth, measure of wealth, and stage of life affect an individual investors’ risk tolerance;  
b. explain the role of situational and psychological profiling in understanding an individual investor’s attitude toward risk;  
c. explain the influence of investor psychology on risk tolerance and investment choices;  
d. explain potential benefits, for both clients and investment advisers, of having a formal investment policy statement;  
e. explain the process involved in creating an investment policy statement;  
f. distinguish between required return and desired return and explain how these affect the individual investor’s investment policy;  
g. explain how to set risk and return objectives for individual investor portfolios and discuss the impact that ability and willingness to take risk have on risk tolerance;  
h. discuss the major constraint categories included in an individual investor’s investment policy statement;  
i. prepare and justify an investment policy statement for an individual investor;  
j. determine the strategic asset allocation that is most appropriate for an individual investor’s specific investment objectives and constraints;  
k. compare Monte Carlo and traditional deterministic approaches to retirement planning and explain the advantages of a Monte Carlo approach.

Reading #11 LOS:  
The candidate should be able to:  
a. discuss the purpose of estate planning and explain the basic concepts of domestic estate planning, including estates, wills, and probate;  
b. explain the two principal forms of wealth transfer taxes and discuss effects of important non-tax issues, such as legal system, forced heirship, and marital property regime;  
c. determine a family’s core capital and excess capital, based on mortality probabilities and Monte Carlo analysis;  
d. evaluate the relative after-tax value of lifetime gifts and testamentary bequests;  
e. explain the estate planning benefit of making lifetime gifts when gift taxes are paid by the donor, rather than the recipient;  
f. evaluate the after-tax benefits of basic estate planning strategies, including generation skipping, spousal exemptions, valuation discounts, and charitable gifts;
g. explain the basic structure of a trust and discuss the differences between revocable and irrevocable trusts;

h. explain how life insurance can be a tax-efficient means of wealth transfer;

i. discuss the two principal systems (source jurisdiction and residence jurisdiction) for establishing a country’s tax jurisdiction;

j. discuss the possible income and estate tax consequences of foreign situated assets and foreign-sourced income;

k. evaluate a client’s tax liability under each of three basic methods (credit, exemption, and deduction) that a country may use to provide relief from double taxation;

l. discuss how increasing international transparency and information exchange among tax authorities affect international estate planning.
Guideline Answer:

Part A

Jack’s legal entitlement is half of the community property. Only 10% of Betty’s assets are community property.
Community property = 10% x USD 120,000,000 = USD 12,000,000
Jack’s legal entitlement = 50% x USD 12,000,000 = USD 6,000,000

Since Jack needs USD 8,000,000, his shortfall is USD 2,000,000.

Assets bequeathed to Jack, above and beyond his legal entitlement under the community property law, will be taxed at the spousal inheritance tax rate of 20%. Therefore, Betty would need to bequeath Jack USD 2,000,000 / (1- 20%) = USD 2,500,000 to meet his spending needs and the spousal inheritance tax of 20%.

Part B

Ryan’s annual net cash outflow during the next four years
= Salary – Spending Needs – Educational Expense
= USD 30,000 – USD 200,000 – USD 190,000 = USD –360,000

Required amount at retirement in 4 years = USD –5,000,000

After-tax investment rate of return = 8% x [1-25%] = 6.00%
Present value of future needs = USD 5,207,906.34
(N = 4, PMT = –360,000, FV = –5,000,000, I/Y = 6.00%)

Non-spousal gift tax = 30%, therefore:
Before-tax gift amount = USD 5,207,906/ (1-30%) = USD 7,439,866

Therefore Betty needs to gift USD 7,439,866 out of her assets. After immediate payment of gift taxes, (USD 2,231,960), Ryan receives USD 5,207,906.
Part C

Ryan’s high spending needs relative to his income is the prominent factor decreasing his ability to take risk. Ryan’s major investment goals (twins’ education and maintaining lifestyle) rely almost entirely rely on portfolio withdrawals. Such a heavy reliance limits the portfolio’s tolerance for losses. Other reasons that limit his ability to take risk are the desire to retire early and the lack of further financial assistance from Betty.

Factors that increase Ryan’s ability to take risk are a long time horizon and the fact that he could return to work if necessary. Furthermore, Ryan can reduce his discretionary spending by reducing his standard of living.

Part D

i. Time horizon constraint
Ryan’s time horizon is long (20+ years) and has two stages separated by the substantial change in portfolio outflows starting at retirement:

- **First stage (From present to the end of fourth year):** The first stage is the next four years until the daughters graduate and Ryan retires.
- **Second stage (Retirement period):** The second period is from retirement until death.

ii. Liquidity constraint
Ryan has two needs for liquidity in the coming year:

Annual payment for the twins’ education (the first payment is due in 12 months) USD 190,000
Annual living expenses USD 200,000
Less salary (USD 30,000)
Net liquidity need USD 360,000

After the twins graduate from college and Ryan retires in four years, the portfolio’s liquidity constraint declines substantially to his living expenses of USD 200,000 per annum.
LEVEL III

Question: 8
Topic: Individual PM
Minutes: 16

Reading References:

Reading #13 LOS:
The candidate should be able to:

a) explain the concept and discuss the characteristics of “human capital” as a component of an investor’s total wealth;
b) discuss the earnings risk, mortality risk, and longevity risk associated with human capital and explain how these risks can be reduced by appropriate portfolio diversification, life insurance, and annuity products;
c) explain how asset allocation policy is influenced by the risk characteristics of human capital and the relative relationships of human capital, financial capital, and total wealth;
d) discuss how asset allocation and the appropriate level of life insurance are influenced by the joint consideration of human capital, financial capital, bequest preferences, risk tolerance, and financial wealth;
e) discuss the financial market risk, longevity risk, and savings risk faced by investors in retirement and explain how these risks can be reduced by appropriate portfolio diversification, insurance products, and savings discipline;
f) discuss the relative advantages of fixed and variable annuities as hedges against longevity risk;
g) recommend basic strategies for asset allocation and risk reduction when given an investor profile of key inputs, including human capital, financial capital, stage of life cycle, bequest preferences, risk tolerance, and financial wealth.
Guideline Answer:

Part A

**Template for Question 8-A**

<table>
<thead>
<tr>
<th>Risk</th>
<th>Determine whether implementing Hamilton’s recommendation would <em>most likely</em> decrease, not change, or increase Ryan’s risk. <em>(circle one)</em></th>
<th>Justify each response.</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Financial market risk</td>
<td>decrease, no change, increase</td>
<td>Financial market risk, or volatility in the capital markets, causes portfolio values to fluctuate in the short-run. In retirement, it is the risk the portfolio cannot support planned withdrawals following low or negative returns during the early years of retirement. Allocating more to fixed income (less-volatile assets) decreases the risk of significant portfolio decline during the early years of Ryan’s retirement.</td>
</tr>
<tr>
<td>ii. Longevity risk</td>
<td>decrease, no change, increase</td>
<td>Longevity risk is the risk of outliving one’s assets. Lower returns from fixed income assets increase the risk that Ryan’s asset base will not be sufficient to cover his lifetime spending needs.</td>
</tr>
</tbody>
</table>
Part B

Converting the entire portfolio to an immediate fixed annuity may not be appropriate for Ryan for the following reasons:

- Low interest rate environment: When buying a fixed annuity the investor locks in payments based on current interest rates. Purchase of a large fixed annuity when interest rates are low will lock in relatively low payments.
- High expected inflation: The real value of payments from a fixed annuity declines over time due to inflation, and rising inflation exacerbates this problem.
- Ryan’s gifting plans: A non-trade-out provision limits gifting ability from the life annuity because it is not liquid. Any gifts would have to be funded from the life annuity payment stream.

Part C

Life insurance protects human capital, which is defined as the present value of future labor income. Information that affects human capital: (1) salary level and (2) correlation between wage growth and risky-asset returns. Higher salary (wages) implies higher future wages and thus higher human capital. Higher correlation implies more volatile (riskier) wages; using a higher discount rate to account for results in a lower value for human capital. The case also provides asset levels for Debra and Kelly. All else constant, financial wealth is a substitute for life insurance. The higher the financial wealth, the lower the demand for insurance.

Less life insurance:
Debra has a higher correlation between wage growth and risky-asset returns because she is employed in a financial firm and part of her income is based on equity returns. Ignoring salary level differential, Debra’s higher wage growth correlation implies lower human capital as her wages are riskier and thus should be subject to a higher discount rate. Therefore, higher wage growth correlation is a factor that reduces life insurance need.

More life insurance:
Ignoring wage correlation differences, Debra’s higher salary (i.e. USD 100,000 for her, compared to USD 75,000 for Kelly) implies higher human capital, thus a higher life insurance need. In addition, financial wealth can be viewed as a substitute for life insurance. Increasing financial wealth reduces the adverse financial impact of human capital loss on surviving heirs. Based on financial wealth, Debra has a higher life insurance need (she has financial wealth of USD 200,000, compared to USD 500,000 for Kelly).
LEVEL III

Question: 9
Topic: Asset Allocation
Minutes: 15

Reading References:
#19 “Currency Management: An Introduction,” by William A. Barker, CFA
#20 “Market Indexes and Benchmarks,” by C. Mitchell Conover, CFA, CIPM

Reading #19 LOS:
The candidate should be able to:
   a. analyze the effects of currency movements on portfolio risk and return;
   b. discuss strategic choices in currency management;
   c. formulate an appropriate currency management program given market facts and client’s objectives and constraints;
   d. compare active currency trading strategies based on economic fundamentals, technical analysis, carry-trade, and volatility trading;
   e. describe how changes in factors underlying active trading strategies affect tactical trading decisions;
   f. describe how forward contracts and FX (foreign exchange) swaps are used to adjust hedge ratios;
   g. describe trading strategies used to reduce hedging costs and modify the risk–return characteristics of a foreign-currency portfolio;
   h. describe the use of cross-hedges, macro-hedges, and minimum-variance-hedge ratios in portfolios exposed to multiple foreign currencies;
   i. discuss challenges for managing emerging market currency exposures.

Reading #20 LOS:
The candidate should be able to:
   a. distinguish between benchmarks and market indexes;
   b. describe investment uses of benchmarks;
   c. compare types of benchmarks;
   d. contrast liability-based benchmarks with asset-based benchmarks;
   e. describe investment uses of market indexes;
   f. discuss tradeoffs in constructing market indexes;
   g. discuss advantages and disadvantages of index weighting schemes;
   h. evaluate the selection of a benchmark for a particular investment strategy.
Guideline Answer:

Part A

Delaney’s choice of an equal-weighted index as a benchmark is supported by the following:

- Because the minimum and maximum position sizes in the fund will be 3% and 5% of the portfolio respectively, positions will be similar in size. Therefore, an equal-weighted benchmark will be more representative of the restrictions placed on the manager than a capitalization-weighted index will be, as the technology sector is dominated by a few large-cap companies.
- An equal-weighted benchmark would fit better with Delaney’s small-cap bias for a sector that is predominantly weighted towards large-cap stocks.

The high per-share prices of some companies in the sector do not argue against using an equal-weighted index. This would be a negative if considering a price-weighted index. Similarly, Delaney’s belief that the sector is undervalued does not favor either equal-weighted or capitalization-weighted, as it implies a similar effect on stocks across the index’s full range of capitalizations.

Part B

Objective 1:

Aron should not execute the forward trade because the return objective is not met.

For the USD-based investor, the expected USD return on the USD/EUR is 1.2045/1.1930 – 1 = 0.96%. Since the EUR return on the portfolio is given at 13.2%, the unhedged USD return on the portfolio is calculated as \((1 + 0.96\%)(1 + 13.2\%) – 1 = 14.29\%).

If Aron decides to hedge by selling EUR forward, the return on the USD/EUR will be 1.2065/1.1930 – 1 = 1.13% and the return on the hedged portfolio would be \((1 + 1.13\%)(1 + 13.2\%) – 1 = 14.48\%).

The difference between the hedged return and the unhedged return is 14.48% – 14.29% = 19 bps, which is less than Aron’s required additional return of 25 bps.

Alternatively, one could calculate the difference between the hedged and unhedged return and get \((1 + 14.48\%)/(1 + 14.29\%) – 1 = 17\) bps, which is also less than Aron’s required return.

Objective 2:

Aron should execute the forward trade because the risk objective is met.
If Aron does not execute the trade, the expected unhedged domestic-currency standard deviation is calculated as follows; note that the USD is the domestic currency and the EUR is the foreign currency:

- \( \sigma(R_{DC}) \) is the standard deviation of the portfolio return in USD.
- \( \sigma(R_{FX}) \) is the standard deviation of the return of the USD/EUR exchange rate.
- \( \sigma(R_{FC}) \) is the standard deviation of the equity portfolio return in EUR.
- \( \rho(R_{FC},R_{FX}) \) is the correlation between the USD/EUR exchange rate returns (changes) and the EUR-denominated equity portfolio returns.

\[
\sigma^2(R_{DC}) \approx \sigma^2(R_{FC}) + \sigma^2(R_{FX}) + 2 \cdot \sigma(R_{FC}) \cdot \sigma(R_{FX}) \cdot \rho(R_{FC},R_{FX})
\]

\[
= 0.15^2 + 0.05^2 + 2 \cdot 0.15 \cdot 0.05 \cdot (-0.07) = 0.02395
\]

Taking the square root of 0.02395 gives \( \sigma(R_{DC}) = 15.48\% \). If Aron executes the trade, the expected USD portfolio standard deviation equals the standard deviation of the EUR equity position, 15.00\%. Therefore, the standard deviation of the portfolio decreases by 15.48\% – 15.00\% = 48 bps, which is more than Aron’s required decrease of 30 bps.

**Part C**

Trade 2 would be the most likely to satisfy Aron’s objectives. By buying a call struck at the current spot rate (1.60), Aron will benefit if GBP appreciates per his outlook. Selling the higher strike price out-of-the-money call at 1.68 (equal to his 5\% appreciation expectation) would provide some premium income to reduce the cost of the trade, while not reducing his potential appreciation below 5\%.

Trade 1 is ineffective because it does not provide upside exposure between the current spot of 1.60 and the current spot plus 5\% of the expected 1.68, on expiration date.

Trade 3 is less effective than Trade 2 because the premium income from selling the call with a 1.72 strike is less than that from selling a call with a 1.68 strike. This trade is less effective at satisfying Aron’s secondary objective, which is to minimize the initial cash outlay.
Reading References:

Reading #16 LOS:
The candidate should be able to:

a. discuss the role of, and a framework for, capital market expectations in the portfolio management process;
b. discuss challenges in developing capital market forecasts;
c. demonstrate the application of formal tools for setting capital market expectations, including statistical tools, discounted cash flow models, the risk premium approach, and financial equilibrium models;
d. explain the use of survey and panel methods and judgment in setting capital market expectations;
e. discuss the inventory and business cycles, the impact of consumer and business spending, and monetary and fiscal policy on the business cycle;
f. discuss the impact that the phases of the business cycle have on short-term/long-term capital market returns;
g. explain the relationship of inflation to the business cycle and the implications of inflation for cash, bonds, equity, and real estate returns;
h. demonstrate the use of the Taylor rule to predict central bank behavior;
i. evaluate 1) the shape of the yield curve as an economic predictor and 2) the relationship between the yield curve and fiscal and monetary policy;
j. identify and interpret the components of economic growth trends and demonstrate the application of economic growth trend analysis to the formulation of capital market expectations;
k. explain how exogenous shocks may affect economic growth trends;
l. identify and interpret macroeconomic, interest rate, and exchange rate linkages between economies;
m. discuss the risks faced by investors in emerging-market securities and the country risk analysis techniques used to evaluate emerging market economies;
n. compare the major approaches to economic forecasting;
o. demonstrate the use of economic information in forecasting asset class returns;
p. explain how economic and competitive factors can affect investment markets, sectors, and specific securities;
q. discuss the relative advantages and limitations of the major approaches to forecasting exchange rates;
r. recommend and justify changes in the component weights of a global investment portfolio based on trends and expected changes in macroeconomic factors.
Guideline Answer:

Part A

The Grinold-Kroner model is used to determine the expected return on equities, taking explicit account of share repurchases. This model provides a means for analysts to incorporate expectations of valuation levels through changes in the P/E ratio.

<table>
<thead>
<tr>
<th>Factor</th>
<th>10-year Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dividend yield</td>
<td>1.80%</td>
</tr>
<tr>
<td>Change in P/E multiple</td>
<td>0.50%</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>1.20%</td>
</tr>
<tr>
<td>Change in number of shares outstanding</td>
<td>−0.30%</td>
</tr>
<tr>
<td>Real total earnings growth rate</td>
<td>2.50%</td>
</tr>
</tbody>
</table>

i. Expected nominal earnings growth return = expected inflation rate plus expected real total earnings growth rate  
   \[ = 1.20\% + 2.50\% = 3.70\% \]

ii. Expected repricing return = per period percentage change in the P/E multiple  
   \[ = 0.50\% \]

iii. Expected income return = expected dividend yield minus expected percentage change in number of shares outstanding  
   \[ = 1.80\% − (−0.30\%) = 2.10\% \]

Part B

The central bank, assuming it follows the Taylor rule, should loosen monetary policy. The Taylor rule links a central bank’s target short-term interest rate to economic growth and inflation. If the optimal short-term interest rate derived from the equation differs from the neutral rate, this suggests that the central bank should change its monetary policy to be more or less accommodative.

Taylor rule:  
\[ R_{\text{optimal}} = R_{\text{neutral}} + [0.5 \times (\text{GDP}_{\text{forecast}} − \text{GDP}_{\text{trend}}) + 0.5 \times (\text{I}_{\text{forecast}} − \text{I}_{\text{target}})] \]

Where:
- \( R_{\text{optimal}} \) = the target for the short-term interest rate
- \( R_{\text{neutral}} \) = the short-term interest rate that would be targeted if GDP growth were on trend and inflation on target
- GDP\(_{\text{forecast}}\) = the GDP forecast growth rate
LEVEL III

Question: 10
Topic: Economics
Minutes: 14

\[ \text{GDP}_{\text{trend}} = \text{the observed GDP trend growth rate} \]
\[ \text{I}_{\text{forecast}} = \text{the forecast inflation rate} \]
\[ \text{I}_{\text{target}} = \text{the target inflation rate} \]

\[ \text{R}_{\text{optimal}} = 2.50\% + [0.5 \times (1.50\% - 2.00\%) + 0.5 \times (1.20\% - 1.00\%)] = 2.35\% \]

Since the optimal short-term rate of 2.35\% is 15 bps lower than the current short-term interest rate target of 2.50\%, the central bank should loosen its monetary policy.

**Part C**

Dvorak should not purchase the bond.

Dvorak must compare the market yield on the bond (4.90\%) with the required yield determined by the sum of the applicable risk premiums. This required yield is calculated as:

\[ \text{Required yield} = \text{Real risk-free interest rate} + \text{Inflation premium} + \text{Default risk premium} + \text{Maturity premium} + \text{Call risk premium} \]
\[ = 1.30\% + 1.50\% + 0.80\% + 1.00\% + 0.60\% \]
\[ = 5.20\% \]

Default risk premium is the 5-year BBB-rated credit risk spread over Treasuries
Call risk premium is the 5-year call risk premium.

The bond should not be purchased because the market yield of 4.90\% does not fully compensate for the risks embedded in the bond.
Reading References:
#7 “The Behavioral Biases of Individuals,” by Michael M. Pompian, CFA

Reading #7 LOS:
The candidate should be able to:
   a. distinguish between cognitive errors and emotional biases;
   b. discuss commonly recognized behavioral biases and their implications for financial decision making;
   c. identify and evaluate an individual’s behavioral biases;
   d. evaluate how behavioral biases affect investment policy and asset allocation decisions and recommend approaches to mitigate their effects.
Guideline Answer:

Part A

Template for Question 11-A
Note: Consider each client and each equity independently.

<table>
<thead>
<tr>
<th>Client (Bias)</th>
<th>Equity</th>
<th>Determine, assuming Chee is correct, which action each client will most likely choose for each of the following equities. (circle one)</th>
<th>Justify each response.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client 1 (Regret-aversion)</td>
<td>Uno Inc.</td>
<td>buy additional shares</td>
<td>An investor with a regret-aversion bias tends to avoid making a decision out of fear that the decision will turn out poorly. Client 1 would likely take no action, in order to avoid the regret that would come from missing further price appreciation in Uno.</td>
</tr>
<tr>
<td></td>
<td>Deux Co.</td>
<td>buy additional shares</td>
<td>An investor with a regret-aversion bias wants to avoid the pain of regret resulting from a poor investment decision. Client 1 would likely take no action in order to avoid the regret that would come from missing a possible recovery in the price of Deux.</td>
</tr>
<tr>
<td>Client 2 (Loss-aversion)</td>
<td>Uno Inc.</td>
<td>buy additional shares</td>
<td>An investor with a loss-aversion bias tends to suffer from the disposition effect, which is the tendency to realize gains early and delay recognizing losses. The investor feels the impact of a loss much more strongly than the impact of a similar gain. The investor may also sell the strong performer to avoid any further perceived risk, regardless of potential future price appreciation. Client 2 is likely to sell Uno to recognize the 20% gain.</td>
</tr>
</tbody>
</table>
An investor with a loss-aversion bias tends to suffer from the disposition effect, which is the tendency to realize gains early and delay recognizing losses. The investor often holds investments in a loss position in the hope that they will return to break even, despite the potential risk of even further price declines. Client 2 would likely take no action and hope to recover the 20% loss in Deux.

### Part B

Client 3 would most likely prefer the fixed income portfolio.

Mental accounting bias occurs when an investor treats one sum of money differently than another equal-sized sum, based on which mental account the money is assigned to. Different investment returns, which should be considered fungible in the total investment account, are assigned different goals.

Client 3 does not consider her principal and income as one fungible account, but rather as two distinct accounts. As such, she will not view the higher total return of the proposed balanced portfolio as more attractive. She believes that she can only spend income earned and will not want to spend principal. She will not prefer the balanced portfolio because of the prospective decline in income and will prefer to keep her current portfolio. Because of her bias, Client 3 will focus only on the income portion of the two alternatives, rather than look at the total return, combining income and capital appreciation.

### Part C

Framing bias causes an investor to answer a question differently based on the way in which it is asked, or “framed.” Client 4 has a history of selecting low-volatility equities and government bonds, which implies a possible frame of safety in his investments. In this case, Rodriguez presents Client 4 with two alternatives, each with the same probability of capital loss (20% chance of incurring a loss, 80% chance of not incurring a loss). However, because the “Y” description focuses on the investment’s riskiness (20% chance of incurring a loss) and the “Z” description focuses on the investment’s safety (80% chance of not incurring a loss), Client 4’s bias would cause him to focus on the positive characteristics of investment Z and prefer it to investment Y.