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.

LEVEL III

Question: 1
Topic: Institutional PM
Minutes: 14

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.

LEVEL III

Question: 1
Topic: Institutional PM
Minutes: 14

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.

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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;

Question: 2
Topic: Institutional PM
Minutes: 17

    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.

LEVEL III

Question: 2
Topic: Institutional PM
Minutes: 17

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.

LEVEL III

Question: 2
Topic: Institutional PM
Minutes: 17

Part C

Template for Question 2-C

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)**	**Justify your response with *two* reasons.**
lower than equal to higher than	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. 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. Note: The board's instruction to be conservative indicates a lower *willingness* to take risk and does not affect the Foundation's ability to take risk.

LEVEL III

Question:	3
Topic:	Fixed Income
Minutes:	19

Reading References:
#21 "Fixed-Income Portfolio Management: Part I," *Managing Investment Portfolios: A Dynamic Process*, Third Edition; by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors

#22 "Relative-Value Methodologies for Global Credit Bond Portfolio Management," *Fixed Income Readings for the Chartered Financial Analyst® Program*, Second Edition, Frank J. Fabozzi, CFA, editor

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;

LEVEL III

Question: 3
Topic: Fixed Income
Minutes: 19

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   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.

LEVEL III

Question: 3
Topic: Fixed Income
Minutes: 19

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.

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LEVEL III

Question: 3
Topic: Fixed Income
Minutes: 19

Part C

Template for Question 3-C
Note: Ignore transaction costs and assume volatility is constant.

Trade	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)	Justify *each* response with *one* reason.
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.

LEVEL III

Question: 3
Topic: Fixed Income
Minutes: 19

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: $(300 - 210) / 50 = 1.8$
Libra: $(320 - 230) / 30 = 3.0$
Taurus: $(340 - 240) / 40 = 2.5$

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:
#25 "Alternative Investments Portfolio Management," *Managing Investment Portfolios: A Dynamic Process*, Third Edition, by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors

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;

LEVEL III

Question: 4
Topic: Alternative Investments
Minutes: 20

    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.**

LEVEL III

Question: 4
Topic: Alternative Investments
Minutes: 20

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

LEVEL III

Question: 4
Topic: Alternative Investments
Minutes: 20

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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.

LEVEL III

Question: 5
Topic: Performance Evaluation
Minutes: 15

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.

LEVEL III

Question: 5
Topic: Performance Evaluation
Minutes: 15

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.

LEVEL III

Question: 5
Topic: Performance Evaluation
Minutes: 15

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:

$$\frac{(MV_1 - CF) - MV_0}{MV_0}$$

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 $r_1 = \dfrac{(135,000,000 - 13,000,000) - 121,000,000}{121,000,000} = 0.0083$

Sub-period 2:
Days 9-23 $r_2 = \dfrac{(127,000,000 - (-8,000,000)) - 135,000,000}{135,000,000} = 0$

Sub-period 3:
Days 24-30 $r_3 = \dfrac{123,000,000 - 127,000,000}{127,000,000} = -0.0315$

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:

TWR = (wr$_1$ x wr$_2$ x wr$_3$) – 1 = (1.0083 x 1 x 0.9685) – 1 = 0.9765 – 1 = –0.0235
TWR = –2.35%

LEVEL III

Question: 5
Topic: Performance Evaluation
Minutes: 15

Part D

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

(Sector portfolio weight – Sector benchmark weight) x (Sector benchmark return – Overall benchmark return)

$(31.35\% - 11.79\%) \, x \, (4.98\% - 4.01\%) = 0.19\%$ or 19 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:

Sector benchmark weight x (Sector portfolio return – Sector benchmark return)

$14.07\% \, x \, [-9.02\% - (-1.71\%)] = -1.03\%$ or –103 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.

LEVEL III

Question: 6
Topic: Risk Management
Minutes: 14

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.

LEVEL III

Question: 6
Topic: Risk Management
Minutes: 14

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.

LEVEL III

Question:	6
Topic:	Risk Management
Minutes:	14

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
#11 "Estate Planning in a Global Context," by Stephen M. Horan, CFA, CIPM, and Thomas R.
    Robinson, CFA

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;

Question: 7
Topic: Individual PM
Minutes: 18

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.

LEVEL III

Question: 7
Topic: Individual PM
Minutes: 18

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.

LEVEL III

Question: 7
Topic: Individual PM
Minutes: 18

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:

- <u>First stage (From present to the end of fourth year)</u>: The first stage is the next four years until the daughters graduate and Ryan retires.
- <u>Second stage (Retirement period)</u>: 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:
#13 "Lifetime Financial Advice: Human Capital, Asset Allocation, and Insurance," by Roger G. Ibbotson, Moshe A. Milevsky, Peng Chen, CFA, and Kevin X. Zhu

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.

LEVEL III

Question: 8
Topic: Individual PM
Minutes: 16

Guideline Answer:

Part A

Template for Question 8-A

Risk	Determine whether implementing Hamilton's recommendation would *most likely* decrease, not change, or increase Ryan's risk. (circle *one*)	Justify *each* response.
i. Financial market risk	(decrease) no change increase	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.
ii. Longevity risk	decrease no change (increase)	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.

LEVEL III

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.

LEVEL III

Question: 9
Topic: Asset Allocation
Minutes: 15

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.

LEVEL III

Question: 9
Topic: Asset Allocation
Minutes: 15

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.

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

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

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.

LEVEL III

Question: 10
Topic: Economics
Minutes: 14

Reading References:
#16 "Capital Market Expectations," *Managing Investment Portfolios: A Dynamic Process*, Third Edition, by John L. Maginn, CFA, Donald L. Tuttle, CFA, Jerald E. Pinto, CFA, and Dennis W. McLeavey, CFA, editors

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.

LEVEL III

Question: 10
Topic: Economics
Minutes: 14

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.

Factor	10-year Forecast
Dividend yield	1.80%
Change in P/E multiple	0.50%
Inflation rate	1.20%
Change in number of shares outstanding	–0.30%
Real total earnings growth rate	2.50%

    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: $R_{optimal} = R_{neutral} + [0.5 \ x \ (GDPg_{forecast} − GDPg_{trend}) + 0.5 \ x \ (I_{forecast} − I_{target})]$

    Where:
    $R_{optimal}$ = the target for the short-term interest rate
    $R_{neutral}$ = the short-term interest rate that would be targeted if GDP growth were on trend and inflation on target
    $GDPg_{forecast}$ = the GDP forecast growth rate

LEVEL III

Question: 10
Topic: Economics
Minutes: 14

GDPg$_{trend}$ = the observed GDP trend growth rate
I$_{forecast}$ = the forecast inflation rate
I$_{target}$ = the target inflation rate

$$R_{optimal} = 2.50\% + [0.5 \; x \; (1.50\% - 2.00\%) + 0.5 \; x \; (1.20\% - 1.00\%)] = 2.35\%$$

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:

Required yield = Real risk-free interest rate + Inflation premium + Default risk premium + Maturity premium + 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.

LEVEL III

Question: 11
Topic: Individual PM - Behavioral
Minutes: 18

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.

LEVEL III

Question: 11
Topic: Individual PM - Behavioral
Minutes: 18

Guideline Answer:

Part A

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

Client (Bias)	Equity	Determine, assuming Chee is correct, which action *each* client will *most likely* choose for *each* of the following equities. (circle one)	Justify *each* response.
Client 1 (Regret-aversion)	Uno Inc.	buy additional shares (take no action) sell	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.
	Deux Co.	buy additional shares (take no action) sell	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.
Client 2 (Loss-aversion)	Uno Inc.	buy additional shares take no action (sell)	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.

LEVEL III

Question: 11
Topic: Individual PM - Behavioral
Minutes: 18

			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.
	Deux Co.	buy additional shares ⬭ take no action sell	

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 prefers 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, Rodriquez 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.

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