



March 2008

CAIA Level II Sample Questions

Chartered Alternative Investment Analyst®

These questions are designed to be representative, but not a facsimile, of the CAIA Level II examination in march 2008. The sample questions do not cover all of the study materials that comprise the CAIA Level II curriculum, nor do they represent the full set of Level II exam questions.

Section 1: Multiple Choice

Question Breakdown

Questions 1 through 7	Professional Standards and Ethics
Questions 8 through 14	Hedge Funds
Questions 15 through 24	Managed Futures
Questions 25 through 35	Private Equity
Questions 36 through 44	Real Estate
Questions 45 through 56	Integrated Topics Readings

Section 2: Short Answer

Provide answers to each part of these 4 questions.

1. Carl St. Germaine believes that reports published by his firm and used as part of presentation materials contain sections that are in violation of the Codes and Standards. He has brought the conduct to the attention of the firm's legal counsel, whose opinion is that the reports can be presented because they are not in violation of any law. He has brought the activity to the attention of the firm's compliance officer, whose recommendation is to trust the opinion of legal counsel. He has taken his concerns to his supervisor, who also concludes that there is nothing to be concerned about, given the counsel's advice.

According to the Codes and Standards, what should Carl do?

- A. Maintain current files for protection in the event of a formal complaint
 - B. Resign from the firm in order to dissociate from the conduct
 - C. Stay informed about changes in the law, in case the advice from legal counsel is no longer valid
 - D. Communicate the Codes and Standards to each of his supervisors with a specific reference to the violations
2. Jose Rivera is an investment advisor who holds a professional designation requiring all members to adhere to the Codes and Standards. He is a resident of an emerging market country that, at this time, has no securities laws and regulations. Jose does business with clients in his home country, but also with clients in neighboring countries that have laws and regulations considered less strict than the Codes and Standards.

Which of the following best describes what Jose must do?

- A. While it is recommended that Jose adhere to the Codes and Standards, he is not required to apply them when advising clients in his home and neighboring countries.
 - B. While it is recommended that Jose adhere to the Codes and Standards, Jose is not required to apply them when advising clients in his home country, but is required to apply them when advising clients in neighboring countries.
 - C. While it is recommended that Jose adhere to the Codes and Standards, Jose is required to apply the less strict laws and regulations when advising clients in both his home and neighboring countries.
 - D. Jose is required to adhere to the Codes and Standards for all clients.
3. Joanna Wasic is a research analyst for a fund of hedge funds. She learns that a portion of the firm's research, prepared by another department, includes survivorship bias such that some of the firm's performance is exaggerated. Joanna presents the report to prospective clients in order to solicit new business, but steers clear of any reference to the exaggerated performance. Accordingly:

- A. Joanna did not violate the Codes and Standards, because she did not include the biased data in her presentation.
 - B. Joanna did not violate the Codes and Standards, because she has never included such a bias in her own research.
 - C. Joanna violated the Codes and Standards, because the report misrepresents performance.
 - D. Joanna violated the Codes and Standards, because the report was prepared by multiple sources, and she failed to explicitly acknowledge those sources.
4. Nadia Petrav is an investment advisor and holds a professional designation that requires all members to adhere to the Codes and Standards. She works for a multinational investment company located in the United States, but is registered in, does business in, and lives in an emerging country with laws and regulations considered less strict than the Codes and Standards. Her home country does not allow advisors to hold short positions for their clients or in their personal account. Which of the following best describes her requirements, according to the Codes and Standards?
- A. Nadia is required to apply the Codes and Standards in all aspects of her business, and is not allowed to hold short positions in either her clients or in her personal account.
 - B. Nadia is required to apply the Codes and Standards in all aspects of her business and is not allowed to hold short positions in her client's accounts, but can hold short positions in her personal account as long as they are disclosed.
 - C. Nadia is required to apply the Codes and Standards in all aspects of her business, and is allowed to hold short positions in both her client's accounts and in her personal account.
 - D. Nadia is required to apply the less strict laws and regulations of her home country, and is not allowed to hold short positions in either her client's accounts or in her personal account.
5. Sharma Vora, a research analyst for the pharmaceutical industry, has recommended that the firm take an equity interest in CISDA, a small biotechnology firm. After writing and publishing his initial report, Sharma purchases CISDA stock for his own portfolio. He has been asked to write a second report on CISDA. What action should Sharma take in order to be compliant with the Codes and Standards?
- Sharma should:
- A. sell his CISDA stock in a relatively short period of time.
 - B. restrict any additional purchase of CISDA stock.
 - C. disclose his CISDA holdings at the time of the second report.
 - D. remove himself as a CISDA analyst.

6. Chase Lieber manages the US Treasury zero coupon bond portfolio for a large investment company, and holds a professional designation requiring members to adhere to the Codes and Standards. His firm employs an interest rate prediction model that governs the selling of the bonds in the portfolio prior to maturity. Speaking at a pension conference, Lieber touts his company's products and states that the bonds in his portfolio are free of risk.

Which of the following statements is consistent with the Codes and Standards?

- A. Chase violated the Codes and Standards by misrepresenting the character of the investment.
 - B. Chase violated the Codes and Standards by trying to steer new business through a speaking engagement at a conference.
 - C. Chase did not violate the Codes and Standards because government issued bonds carry no risk of default.
 - D. Chase did not violate the Codes and Standards because he bases his statements on an interest rate prediction model.
7. Joanna Malitz is a member of the quantitative analysis team at First Investments and holds a professional designation requiring members to adhere to the Codes and Standards. When preparing the monthly newsletter to her clients she writes about the likelihood of increasing interest rates due to the recent fall in the unemployment rate. Her report fails to cite the U.S. Department of Labor, the agency that prepares unemployment statistics for the U.S. economy.

Which of the following statements about Joanna's actions is consistent with the Codes and Standards?

- A. Joanna violated the standards by failing to acknowledge the U.S. Department of Labor.
- B. Joanna violated the Codes and Standards by misrepresenting the services of the firm to current and prospective clients.
- C. There is no violation, because the U.S. Department of Labor is a recognized statistical reporting service.
- D. There is no violation, because the statement in the newsletter represents Joanna's opinion (not a fact) about the direction of future interest rates.

8. A convertible bond with 12 years to maturity and a 6% coupon has a conversion price of \$25. Analysts expect that if the underlying stock moves up 30% over the next 12 months the price of the convertible is expected to increase by 14%, and if the stock price moves down by 30% the price of the convertible is expected to decrease by 11%. This convertible offers a reward to risk ratio of:
- A. 1 to 1
 - B. 2 to 1
 - C. 3 to 1
 - D. 4 to 1
9. Which segment of the convertible profile graph is described by a convertible option that is “at-the-money?”
- A. Distressed
 - B. Busted
 - C. Hybrid
 - D. Equity
10. Which of the following characteristics would a convertible bond arbitrageur seek?
- A. High gamma
 - B. Overvalued convertibles
 - C. Low volatility of the underlying stock
 - D. High conversion premium
11. Which of the following Greeks measures the change in a convertible security’s value with respect to a change in interest rates?
- A. Chi
 - B. Rho
 - C. Omicron
 - D. Theta
12. Which characteristic is used to identify a long busted convertible with call write and long out-of-the money call protection hedge opportunity?
- A. A deteriorating credit quality.
 - B. Technical strength in the underlying stock price.
 - C. A convertible trading at or very near its investment value.
 - D. A convertible within an industry experiencing significant M&A activity.

13. Which of the following is TRUE of a reverse convertible bond hedge?
- A. The arbitrageur buys the convertible.
 - B. The arbitrageur takes a long position in the underlying common stock.
 - C. The hedge is long volatility.
 - D. The hedge creates a positive cash flow carry.
14. This nontraditional convertible arbitrage hedge occurs when the arbitrageur determines that the market has overreacted to an issue's credit concern.
- A. Credit spread convergence.
 - B. Reset convertibles.
 - C. Capital structure hedge.
 - D. Negative gamma bull hedge.
15. Which of the following stock market theories states that investors are more risk averse when dealing with profitable investments and more risk seeking when dealing with investments with losses?
- A. Mean reversion theory.
 - B. Trend following theory.
 - C. Prospect theory.
 - D. Double bottom theory.

16. From the following price series:

Day	1	2	3	4	5	6	7	8	9	10
Close	6	9	12	8	10	13	17	23	21	23

Which of the following comes closest to the simple four-day moving average (as shown in Kestner) in Day 5?

- A. 9.25
- B. 9.50
- C. 9.75
- D. 10.00

17. From the following price series:

Day	1	2	3	4	5	6	7	8	9	10
Close	6	9	12	8	10	13	17	23	21	23

Which of the following comes closest to the weighted four-day moving average (as shown in Kestner) in Day 10?

- A. 21.80
- B. 22.20
- C. 22.60
- D. 23.00

18. What trading rule says, for example, buy if today's close is the highest of the past x days?

- A. Relative strength breakout.
- B. Fail-safe breakout.
- C. Moving average breakout.
- D. Channel breakout.

19. Which of the following describes a trading exit that is set up to sell long positions whenever the market closes below the previous pivot point low?

- A. A profit target
- B. A fail-safe exit
- C. A trailing exit
- D. A stochastic exit

A log of recent trades is shown in the table below. Use this data to answer the following 2 questions.

Trade Day	Day's Profit/Loss	Cumulative Profit/Loss
1	\$23	\$23
2	(\$6)	\$17
3	(\$1)	\$16
4	(\$5)	\$11
5	(\$2)	\$9
6	(\$3)	\$6
7	(\$2)	\$4
8	\$2	\$6
9	\$11	\$17
10	\$6	\$23
	Slope	-0.44848
	Standard Error	.07271572

20. Which of the following statements is consistent with Kestner's view of the statistic known as percent of profitable trades?
- "This was a bad period because the percent of profitable trades is less than one."
 - "This was a bad period because the percent of profitable trades is outside the allowable range."
 - "We don't know whether this was a bad period or not because the statistic has no bearing on the performance of my portfolio."
 - "We don't know whether this was a bad period or not because we don't have enough information to calculate the statistic."
21. What number comes closest to the K-ratio?
- 1.24
 - 0.62
 - 0.00
 - 0.62
22. Which of the following best describes the divergence index?
- It is a filtering method based upon the profitability of the last trade.
 - It measures the strength of pullbacks in trending markets.
 - It is used to determine the percent of profitable trends.
 - It sets triggers based upon volatility breakout rules.

23. What type of strategy would describe a trader attempting to exploit the difference between the current price of stock index futures versus that of the stocks that underlie the index?
- A. A bottom up relative value strategy
 - B. A top down relative value strategy
 - C. A pure arbitrage strategy
 - D. A macro trading strategy
24. What trade would represent a pure play on volatility?
- A. A straddle
 - B. A swap spread
 - C. A macro trade
 - D. A stock pair
25. Which of the following statements apply more to buyout funds than to venture capital funds?
- A. Their valuation risk is high because heroic assumptions are required with traditional valuation methods.
 - B. Their source of returns comes primarily from leverage and company building.
 - C. They are invested in rapidly growing sectors or cutting edge technology.
 - D. Their returns' sensitivity to public markets is high.
26. Which of the following describes a top-down approach to constructing a private equity portfolio?
- A. An approach that begins with a general economic analysis
 - B. An approach that is opportunistic and that can lead to an unbalanced portfolio
 - C. An approach that is simple and robust because it depends on ranking
 - D. An approach that involves picking the best managers
27. Which of the following most applies to cost averaging in the private equity markets?
- A. Cost averaging can be viewed as part of an asset allocation strategy, but with deviations from long-term objectives.
 - B. There is a consensus in the industry that cost averaging doesn't work.
 - C. Cost averaging can be seen as naïve diversification over time.
 - D. Cost averaging requires forecasting which vintage year will present the best opportunities.

28. Which of the following best describes the over-commitment strategy by limited partners?
- A. Minimizing the over-commitment ratio.
 - B. It is possible because on average, only a small fraction of limited partners' commitments is invested each year.
 - C. Mitigating diversification over time.
 - D. Striving for a maximum allocation of commitments per year.
29. What are two main exit routes prior to private equity funds' maturity? (Mature funds have been existence for over two years.)
- A. Secondary transactions and securitization
 - B. Realizations and limited partner default
 - C. Liquidity lines and selling maturing investments
 - D. Securitization and limited partner default
30. What do the total value to paid-in ratio (TVPI), distribution to paid in-ratio (DPI), and residual value to paid-in (RVPI) all have in common?
- A. They are measures of liquidity
 - B. They take into account the time value of money
 - C. They use an estimated NAV in the numerator
 - D. They use the sum of all estimated cash outflows in the denominator
31. The following table lists government zero coupon yields. In estimating a private equity fund discount rate, what rate should be used for an estimate of the risk-free rate?

Year	1	2	4	6	8	10	12
Yield	1.5%	3%	3.5%	4%	4.5%	5.5%	6%

- A. 1.5%
- B. 3.0%
- C. 4.5%
- D. 6.0%

32. Which method of estimating private equity betas involves calculating an unleveraged beta?
- A. Quoted comparables
 - B. Relative risk measures
 - C. Bottom-up beta
 - D. Beta based on modified and corrected data
33. Which of the following limited partnership agreement terms is designed to align the interests of private equity market participants?
- A. A preferred return set at 6% to 8% above the prevailing risk-free rate of return.
 - B. Carried interest calculated on a deal-by-deal basis.
 - C. Carried interest calculated on a fund-as-a-whole basis for real estate funds.
 - D. A 20% carried interest payable if the rate of return exceeds the hurdle rate or preferred return.
34. Can aggregate net asset values (NAVs) of individual companies comprising private equity funds approximate the economic value of the total private equity fund?
- A. Yes, as long as the NAVs are calculated according to the new valuation guidelines (AFIC, BVCA, & EVCA).
 - B. Yes, because it is theoretically possible to break up the fund and sell off the positions immediately and individually.
 - C. No, because, in part, the management team adds value and should be included.
 - D. No, because it is impossible to determine the fair value of private companies.
35. Which of the following statements most accurately describes the benefits and costs of using a fund of funds structure relative to an in-house private equity investment program?
- A. The additional layer of management fees charged by fund of funds is inefficient relative to in-house private equity investment programs.
 - B. The scale economies provided by fund of funds are almost always cheaper than in-house private equity investment programs.
 - C. Fund of funds avoids the burden of research, due diligence, ongoing monitoring, reporting and administration associated with in-house private equity investment programs.
 - D. Fund of funds requires a subscription-based funding approach that leads to inefficient liquidity management compared with in-house private equity investment programs.

36. Why do REITS, as an industry, have a low potential for growth?
- A. Because they have fewer investment opportunities.
 - B. Because they generate most of their income from mortgage investments.
 - C. Because they must pay out a minimum of 90% of their taxable income as dividends.
 - D. Because their size is limited by law.
37. Which of the following represents a major disadvantage of the UPREIT organizational structure?
- A. Creation of conflicts of interests among REIT stakeholders
 - B. Restriction on the number of shareholders a REIT can have
 - C. Limitation on the investment flexibility of a REIT
 - D. Restriction on the capital raising ability of a REIT
38. Using external advisors in managing investment and property has had what effect on the REIT industry?
- A. An increase in profitability due to greater tax shields.
 - B. An increase in profitability due to greater managerial expertise.
 - C. Slower growth due to an increase in capital gains taxes.
 - D. Slower growth due to the potential for self dealing.
39. What is one reason why significant increase in REIT size through mergers is unlikely?
- A. Legal protection enjoyed by REITs against hostile takeovers
 - B. Lower operating profits of large REITs
 - C. Higher operating expenses of large REITs
 - D. Failure of large REITs to achieve economies of scope
40. Which of the following is TRUE about institutional investors in REIT stocks?
- A. They tend to invest in lower quality REIT stocks.
 - B. They tend to shy away from locations where the share of local employment is in business services.
 - C. They tend to invest in smaller, undervalued REIT stocks.
 - D. They tend to invest in safer and less speculative locations.

41. Which of the following provides one reason why REITs might not have the incentive to use debt?
- A. REITs can fund most of their financing needs internally
 - B. REITs cannot take advantage of favorable debt related tax shields
 - C. REITs are required by law to maintain low levels of debt
 - D. REITs have high dividend payout ratios
42. Which of the following describes the stock performance of REIT IPOs on the first trading day?
- A. About the same as industrial firm IPOs.
 - B. Much better than industrial firm IPOs.
 - C. Much worse than that of industrial firm IPOs.
 - D. Better in most years compared with industrial IPOs, but not in every year.
43. What empirical relationship has been found to exist between REIT returns and real estate property returns?
- A. REIT returns lead changes in property returns by as much as one or two months.
 - B. REIT returns lead changes in property returns by as much as one or two years.
 - C. REIT returns lag changes in property returns by as much as one or two months.
 - D. REIT returns lag changes in property returns by as much as one or two years.
44. Which of the following best describes the evidence reported on REIT trading strategies?
- A. Short-term price reversals beat buy-and-hold strategies, even after factoring in reasonable transaction costs.
 - B. Short-term price reversals did not work very well decades ago, but have produced strong profits in the 1980s and 1990s.
 - C. Contrarian filter rules have been shown to beat the buy-and-hold strategy, even after factoring in reasonable transaction costs.
 - D. The rather dismal performance of REIT strategies can be explained by the fact that cash flow is less important for real estate returns relative to other stocks.
45. As a risk measure, how does the use of maximum drawdown, as opposed to standard deviation, change the optimal allocation to real estate?
- A. The optimal allocation would be lower.
 - B. The optimal allocation would be higher.
 - C. The optimal allocation would be about the same.
 - D. The optimal allocation would be lower for commercial properties and higher for residential properties.

46. Which of the following is NOT one of the factors contributing to the increased international allocation to real estate?
- A. Availability of benchmarks
 - B. Growing integration of economic regions
 - C. Lower liquidity premium in REITs
 - D. Establishment of a working international institutional framework
47. How has the source of supply of private equity deals in Central Eastern Europe shifted over the last ten years?
- A. From spin-offs of non-core business units to privatized state owned enterprises
 - B. From small family owned firms to subsidiaries of large multinational corporations
 - C. From privatized state owned enterprises to spin-offs of non-core business units
 - D. From subsidiaries of multinational corporations to small family owned business units
48. Under what condition does an investor who has established a long position in a 3-month oil futures contract profit from this position?
- A. When the spot price of oil increases over the next three months.
 - B. When the spot price of oil decreases over the next three months.
 - C. When the spot price of oil is higher than today's futures price in three months.
 - D. When the spot price of oil is lower than today's futures price in three months.
49. How can we describe the average risk premium on commodities since 1959?
- A. It's been about the same as the risk premium on bonds
 - B. It's been lower than the risk premium on bonds
 - C. It's been higher than the risk premium on stocks
 - D. It's been about the same as the risk premium on stocks
50. Consider an equity market where prices are volatile but are not trending, and an investor who is in both cash and equity. What would be TRUE in this case?
- A. A simple buy-and-hold will outperform a simple constant-mix strategy.
 - B. A simple constant-mix strategy will outperform a simple buy-and-hold strategy.
 - C. A simple constant-mix strategy will underperform a constant-proportion portfolio insurance strategy.
 - D. A constant-proportion portfolio insurance strategy will outperform a simple buy-and-hold strategy.

51. What does a convex trading strategy refer to?
- A. A strategy that holds a constant mix of assets
 - B. A buy-and-hold strategy
 - C. A strategy where past winners are purchased and past losers are sold
 - D. A strategy that replicates the payoff from a covered call strategy
52. An insurance company is considering a proposal to cover the risk associated with a contest that offers a grand prize of \$2 billion. The expected loss from this contest, sometimes referred to as a one-time Super Cat, is \$500. The insurance company has decided that the premium for this one-time event at 99% confidence level will be \$1.2 million. What is likely to be the premium per event if this lottery were to be held 4 times?
- A. \$ 300,000
 - B. \$ 600,000
 - C. \$ 900,000
 - D. \$1,200,000
53. According to recent studies, “alpha generator” managers can be selected by concentrating on what?
- A. Those whose historical returns can be explained by exposures to various risk factors such as small and large cap stocks
 - B. Those whose historical returns cannot be explained by exposures to various risk factors such as small and large cap stocks
 - C. Those who invest in high beta stocks and bonds
 - D. Those who have been able to attract large amount of capital recently
54. According to Malkiel and Saha, which of the following statements about database bias is TRUE?
- A. The average backfilled bias reported in the TASS database has been increasing in recent years.
 - B. The average backfilled bias reported in the TASS database has been about 0.5% per year for an average fund.
 - C. The average survivorship bias reported in the TASS database has been steadily increasing in recent years.
 - D. The average survivorship bias reported in the TASS database has been about 4.4% per year.

55. In the absence of convenience yield in a commodity market, which of the following statements is consistent with storage theory?
- A. The futures price will typically be in normal backwardation.
 - B. The futures price will typically be in normal contango.
 - C. The current futures price will typically be lower than the expected future spot price.
 - D. The current spot price will typically be higher than the expected futures price.
56. Under what condition would a US on-shore hedge fund manager NOT have to register under the Advisers Act?
- A. If they invest less than \$500 million in publicly traded securities
 - B. If they invest in foreign stocks and bonds
 - C. If they have less than 15 clients
 - D. If they do not accept funds from ERISA qualified pension funds

Section 2: Short Answer Questions

Answers should be clear and concise. Full sentences are not required. Not all questions require the same length of response. Be guided by the notion that complete answers that call for discussion, explanation, or description can be written in one or two paragraphs.

Guideline answers are provided after each question. The guideline answer represents a complete and comprehensive answer to each question. Candidates will not be expected to provide answers of this length on the exam.

Question 1

Rui Gomes holds a professional designation that requires all members to adhere to the Codes and Standards. He has created a website and discussion room in order to attract new clients to the firm with which he is employed and to publish his recommendations. In a recent forum he placed a buy recommendation on a particular merger arbitrage fund based upon a study of the performance of the targets of three large takeovers between September and November of 2006.

- A. Describe the violation of the Codes and Standards. You need not quote the number and/or letter of the standard, but must provide an explicit description as it applies to this situation.

(3 Points)

- B. Provide two recommended procedures for compliance to support the principles of the standard that was violated.

(2 Points)

Question 2

Joe Fairbanks, an asset manager for Montre Advisors, is considering the addition of one of two standard-type convertible bonds to his portfolio. Information on the two bonds is given in the table below:

Bond	Par	Coupon	Maturity	Correlation with World Equity Index	Current Price	Credit Rating
Bond A	\$1,000	8.68%	3/11/09	0.683	\$1,235	BB
Bond Z	\$1,000	8.43%	4/24/09	0.157	\$ 972	BB

- A. Based on the information above, which of the two bonds, Bond A or Bond Z, will likely have a higher delta? Explain your answer.

(1 Point)

- B. Based on the information above, which bond, Bond A or Bond Z, has a greater ability to capture gamma? Explain your answer.

(3 Points)

- C. Which of the two bonds, Bond A or Bond Z, will likely have a greater sensitivity to omicron? Explain your answer.

(2 Points)

Question 3

John Patel, a junior analyst for a large fund, is constructing a hypothetical portfolio consisting of stocks, bonds, and real estate. He is evaluating the merit of adding to the portfolio one of the two real estate loans given in Table 1 below. Answer each of the following questions using the data below.

Loan	Maturity	YTM	Price	Par	Terms
Loan A	10 Years	16%	\$507	\$1,000	Non-recourse
Loan B	10 Years	16%	\$517	\$1,000	Recourse

- A. John recalls that loan terms can be considered an option, but he can't remember if it's a call or a put, nor in which loan, Loan A or Loan B, the option resides. Help him by explaining the difference between recourse and non-recourse lending, and by explaining the nature of the option component that's embedded into this loan.

(2 points)

- B. Which of the two loans would you suggest John add to the portfolio? Justify your choice.

(2 points)

- C. John is considering adding leverage to his real estate portfolio. Will the existence of leverage improve real estate's diversification benefits, or dampen them? Explain.

(2 points)

Question 4

Nikunj Thanawala, Chief Investment Analyst for World Investment Management (WIM), is considering a role for timber in his large diversified portfolio. At the current time the main asset classes of WIM's portfolio include equities (37%), fixed income (32%), real estate (15%), private equity holdings (9%), and absolute return vehicles (7%). Nikunj is looking to enhance the portfolio's holdings in alternative investments, and is giving a serious but cautious look at timber as an asset class. He's asked his assistant to provide some historical information in order to perform some preliminary analysis. This appears in Exhibit 1.

EXHIBIT 1

Year	Timberland Property Index	AAA	G Bond	REITs	S&P	Plum Creek Timber
1990	11.06	8.61	7.74	(23.44)	(6.56)	(3.53)
1991	20.27	15.87	19.36	23.84	26.31	78.87
1992	37.32	10.64	7.34	15.13	4.46	46.87
1993	22.36	14.66	13.06	15.14	7.06	89.23
1994	15.45	(2.43)	(7.32)	2.66	(1.54)	(18.10)
1995	13.84	21.99	25.94	12.24	34.11	28.35
1996	10.73	4.24	0.13	37.04	20.26	18.07
1997	18.91	10.85	12.02	19.53	31.01	24.09
1998	5.86	10.91	14.45	(16.96)	26.67	(6.81)
1999	10.92	(3.04)	(7.51)	(2.57)	19.53	4.37
2000	4.41	11.69	17.22	31.04	(10.14)	14.16
2001	(5.25)	11.46	5.51	12.41	(13.04)	20.64
2002	1.86	11.18	15.15	3.58	(23.37)	(12.07)
2003	7.66	9.23	0.54	40.81	26.38	36.39
2004	11.20	6.51	4.59	29.55	8.99	31.76
Average	12.44	9.49	8.55	13.33	10.01	23.49
Max	37.32	21.99	25.94	40.81	34.11	89.23
Min	(5.25)	(3.04)	(7.51)	(23.44)	(23.37)	(18.10)
St.Dev	9.98	6.42	9.55	18.48	17.99	30.85

CORRELATION MATRIX

	Timber	AAA	G Bond	REITs	S&P	Plum Creek
Timber	1.00	0.08	0.04	0.08	0.33	0.52
AAA		1.00	0.93	0.14	0.17	0.51
G Bond			1.00	0.00	0.11	0.33
Junk B				0.57	0.61	0.81
Inflation				(0.26)	(0.28)	(0.07)
Gold				0.03	(0.40)	0.01
REITs				1.00	0.22	0.49
S&P					1.00	0.33
Plum Creek						1.00

- A. You've heard timber described as a low risk and low return asset class. Is this born out in the data? In your explanation, consider timber both as a stand alone asset and as part of a diversified portfolio.

(4 points)

- B. What hurdle rate would you estimate for a timber investment? For this part you can either perform a hurdle rate analysis, or quote from a previous analysis (provide the source). List two (2) possible market imperfections that could impact this hurdle rate.

$$\text{Hurdle rate} = (R_p - R_f) * \rho_{y,p} * (\sigma_y / \sigma_p) + R_f$$

(3 points)

- C. Your assistant has also provided you with some data on Plum Creek Timber Company, one of the largest private timberland owners in the U.S. Some historical data on Plum Creek has been included in Exhibit 1. Provide one (1) argument why you believe Plum Creek is a good benchmark for the timber investment, and two (2) arguments why you believe it is not.

(3 points)

Answer Key: Multiple Choice Questions

For Text References: SPH = Standards of Practice Handbook, CAL = Convertible Arbitrage (Calamos), KES = Quantitative Trading Strategies (Kestner), MM = Beyond the J Curve: Managing a Portfolio of Venture Capital and Private Equity (Meyer and Mathonet), and CEW = Real Estate Investment Trusts (Chan, Erickson, and Wang).

Question Number	Answer	Reference	Topic and Learning Objective
1	B	SPH, pages 12-13	Topic 1, LO 1a
2	D	SPH, pages 12-13	Topic 1, LO 1a
3	C	SPH, pages 12-13	Topic 1, LO 1a
4	A	SPH, pages 12-13	Topic 1, LO 1a
5	C	SPH, pages 113-114	Topic 2, LO 3a
6	A	SPH, pages 25-32	Topic 1, LO 1c
7	C	SPH, pages 25-35	Topic 1, LO 1c
8	D	CAL, page 18	Topic 3, LO 5
9	C	CAL, pages 22-3	Topic 3, LO 6
10	A	CAL, pages 23-5	Topic 3, LO 7
11	B	CAL, page 59	Topic 3, LO 15
12	C	CAL, pages 205-6	Topic 3, LO 28c
13	B	CAL, pages 194-6	Topic 3, LO 32
14	D	CAL, pages 222-4	Topic 3, LO 36
15	C	KES, pages 26-30	Topic 4, LO 4
16	C	KES, page 57	Topic 4, LO 6
17	A	KES, page 57	Topic 4, LO 6
18	D	KES, pages 60-2	Topic 4, LO 8
19	C	KES, pages 69-73	Topic 4, LO 10
20	C	KES, pages 82-4	Topic 4, LO 11
21	B	KES, pages 85-9	Topic 4, LO 13
22	B	KES, pages 197-202	Topic 4, LO 22
23	C	KES, pages 247-51	Topic 4, LO 27
24	A	KES, pages 299-303	Topic 4, LO 35
25	B	MM, pages 41-46	Topic 5, LO 7
26	A	MM, pages 82-83	Topic 5, LO 12
27	C	MM, pages 91-92	Topic 5, LO 15
28	B	MM, pages 119-122	Topic 5, LO 16
29	A	MM, pages 155-159	Topic 5, LO 21
30	D	MM, page 167	Topic 5, LO 25
31	C	MM, page 254	Topic 5, LO 30
32	C	MM, pages 257-264	Topic 5, LO 32
33	D	MM, pages 27-38	Topic 5, LO 6
34	C	MM, pages 154-155	Topic 5, LO 20
35	C	MM, pages 47-54	Topic 5, LO 8
36	C	CEW, page 38	Topic 6, LO 10
37	A	CEW, pages 48-51	Topic 6, LO 11
38	D	CEW, pages 55-9	Topic 6, LO 13
39	A	CEW, pages 70-84	Topic 6, LO 18

Question Number	Answer	Reference	Topic and Learning Objective
40	D	CEW, pages 91-92	Topic 6, LO 20
41	B	CEW, pages 138-9	Topic 6, LO 30
42	C	CEW, pages 167-170	Topic 6, LO 36
43	B	CEW, pages 198-9	Topic 6, LO 44
44	C	CEW, pages 239-41	Topic 6, LO 52
45	A	Reading 1, Page 8	Topic 7, LO 1
46	C	Reading 1, Page 9	Topic 7, LO 1
47	C	Reading 2, Page 22	Topic 7, LO 6
48	C	Reading 3, Page 32	Topic 7, LO 10
49	D	Reading 3, Page 36	Topic 7, LO 14
50	B	Reading 3, Page 66	Topic 8, LO 10
51	C	Reading 3, Page 69	Topic 8, LO 10
52	B	Reading 4, Page 43	Topic 8, LO 12
53	B	Reading 3, Page 115	Topic 9, LO 11
54	D	Reading 4, Pages 134-135	Topic 9, LO 18
55	B	Reading 7, Page 178	Topic 9, LO 30
56	C	Reading 6, Pages 232-233	Topic 10, LO 14

Answer Key: Short Answer Questions

Guideline for Short Answer Question 1

Purpose: *To test candidates' ability to understand the Standards of Professional Conduct as published by the CFA Institute.*

Learning Objectives: *Apply Standard V with respect to Diligence and Reasonable Basis. (p. 99-103)*

Rui Gomes holds a professional designation that requires all members to adhere to the Codes and Standards. He has created a website and discussion room in order to attract new clients to the firm with which he is employed and to publish his recommendations. In a recent forum he placed a buy recommendation on a particular merger arbitrage fund based upon a study of the performance of the targets of three large takeovers between September and November of 2006.

- A. Describe the violation of the Codes and Standards. You need not quote the number and/or letter of the standard, but must provide an explicit description as it applies to this situation.

(3 Points)

*Standard V: Investment Analysis, Recommendations, and Actions
(A) Diligence and Reasonable Basis*

The application of Standard V(A) is dependent on the investment philosophy followed, the role of the member or candidate in the investment decision making process, and the support and resources provided by the member or candidate's employer. These factors will dictate the nature of the diligence, thoroughness of the research, and the level of investigation required by Standard V(A).

The requirements for issuing conclusions on research will vary based on the member of candidate's role in the investment making process, but the member or candidate must make reasonable efforts to cover all pertinent issues when arriving at the recommendation. Members and candidates enhance transparency by providing or offering to provide supporting information to clients when recommending a purchase or sale or when changing a recommendation.

Given this standard, it is clear that Rui did not exercise the level of thoroughness required to recommend investment into a hedge fund. Note that the standard does not require the use of secondary or third-party research, only that the recommendations are based upon reasonable and diligent efforts to determine that the research is sound.

- B. Provide two recommended procedures for compliance to support the principles of the standard that was violated.

(2 Points)

Recommended Procedures for Compliance

Members and candidates should encourage their firms to consider the following policies and procedures to support the principles of Standard V(A):

- 1. Establish a policy requiring that research reports and recommendations have a basis that can be substantiated as reasonable and adequate. An individual employee (supervisory analyst) or a group of employees (review committee) should be appointed to review all research reports and recommendations prior to external circulation to determine whether they meet the criteria established in the policy.*
- 2. Develop detailed, written guidance for research analysts, supervisory analysts, and review committees that establish due-diligence procedures for judging whether a particular recommendation has a reasonable and adequate basis.*
- 3. Develop measurable criteria for assessing the quality of research, including the reasonableness and adequacy of the basis for any recommendation and the accuracy of the recommendations over time, and implement compensation arrangements that depend on these measurable criteria that are applied consistently to all research analysts.*

Guideline for Short Answer Question 2

Purpose: To test candidates' ability to understand the basics of the convertible arbitrage trade, the description of the various risks embedded in the convertible arbitrage trade (the Greeks), and how these risks can be hedged.

Keywords: Arbitrage, delta, gamma, omicron

Learning Objectives: The candidate should be able to:

- Explain the rationale behind hedging with convertibles. {p. 6-7}
- List and explain the basic characteristics of convertible securities and the risks of the convertible arbitrage strategy {p. 12-8}
- Understand the significance of the basic Greeks (delta, modified delta, gamma, vega, theta and rho) for convertible arbitrage strategies. {p. 48-60}
- Explain the significance of chi, omicron, epsilon, and phi. {p. 64-70}
- Understand and explain gamma hedging. {p. 134-147}

Joe Fairbanks, an asset manager for Montre Advisors, is considering the addition of one of two standard-type convertible bonds to his portfolio. Information on the two bonds is given in the table below:

Bond	Par	Coupon	Maturity	Correlation with World Equity Index	Current Price	Credit Rating
Bond A	\$1,000	8.68%	3/11/09	0.683	\$1,235	BB
Bond Z	\$1,000	8.43%	4/24/09	0.157	\$ 972	BB

- A. Based on the information above, which of the two bonds, Bond A or Bond Z, will likely have a higher delta?

(1 Point)

The convertible bond's delta is an estimation tool used to determine the number of shares of stock to short against the long position in the convertible bond to establish a neutral hedge. The delta measures the convertible's equity sensitivity for a very small change in the price of the underlying stock. Delta values toward zero indicate out-of-the-money options such that the convertible bond trades with a low degree of equity sensitivity. Delta values toward one indicate in-the-money options and convertible bonds that trade with a high degree of equity sensitivity.

Bond A, with a current price above par would have the higher delta compared with Bond Z whose price is below par. The correlation to the world equity index is consistent with this conclusion, as Bond A is in-the-money and would be expected to

correlate higher with movements in equity while bond Z is out-of-the money and would be expected to have low correlation with equities.

- B. Based on the information above, which bond, Bond A or Bond Z, has a greater ability to capture gamma?

(3 Points)

The change in delta with respect to changes in the common-stock price is called gamma. Gamma is the second-order partial derivative of the convertible price with respect to changes in the underlying common stock, and measures the convexity of the convertible price track.

Convertible hedging to capture gamma is a means of taking advantage of the change in delta for rising stock prices as compared to a smaller change in delta for declining stock prices. Hedging convertibles to capture arbitrage profits often entails high-gamma convertibles, and the profits are earned no matter if the stock moves up or down. When the underlying share price rises, the convertible rises by a little bit more than predicted by delta and by more than the short position loses value. When the underlying share price falls, the convertible loses a little bit less than the short equity hedge gains. The position fails to earn profits when the stock price does not move in either direction. In fact, gamma trading will be more profitable the more often the share price moves sufficiently to justify a rebalancing of the delta hedged position.

Given this background, there are two answers to this question.

Answer One: Because gamma is relatively low for both in-the-money and out-of-the-money convertibles, and because it has been established that Bond A is an in-the-money convertible and that Bond Z is an out-of-the money convertible, it is impossible to say which of the two bonds has a greater ability to capture gamma.

Answer Two: If we assume that Bond Z is a low grade convertible that is trading in the “distressed range,” that is, trading at or below its floor, then we might infer that the gamma of Bond Z is actually negative. Given that the credit rating of Bond Z is BB, perhaps we can dismiss this as a possibility. However, we have no information about the when the rating was put out, and so it is possible that Bond Z has recently seen its credit deteriorate.

- C. Which of the two bonds, Bond A or Bond Z, will likely have a greater sensitivity to omicron?

(2 Points)

Omicron measures the change in the fair value of the convertible with respect to a change in the credit spread. For many low grade issues, this is an especially telling measure. An out-of-the-money convertible is generally more sensitive to changes in

credit spreads than any other convertible. In contrast, convertibles that are in-the-money, especially deep in-the-money, will have a low sensitivity to credit spread changes.

Bond Z, with a current price below par and with low correlation to MSCI World would have higher omicron compared with Bond A whose price is above par and whose correlation with MSCI World is high.

Guideline for Short Answer Question 3

Purpose: *To test candidates' ability to understand the use of non-recourse terms in lending, and how leverage can be integrated into real estate portfolios.*

Keywords: *Non-recourse terms, put option, enhanced diversification, stop-loss tool*

Learning Objectives: *From the article "Should One Use Leverage in a Private Equity Real Estate Portfolio":*

- *explain the use of non-recourse borrowing as a stop-loss tool.*
- *argue against the use of leverage in a real estate portfolio, including a discussion of the market cycle and volatility.*
- *argue for the use of leverage in a real estate portfolio, providing five reasons for doing so.*

- A. John recalls that loan terms can be considered an option, but he can't remember if it's a call or a put, nor in which loan, Loan A or Loan B, the option resides. Help him by explaining the difference between recourse and non-recourse lending, and by explaining the nature of the option component that's embedded into this loan.

(2 points)

Since non-recourse debt allows the lender access only to the collateral in the case of a default or other violation of the terms of the mortgage, this term essentially renders the loan a put option. When borrowing on a non-recourse basis, one is short-selling the asset; the borrower takes money out of the asset, thereby reducing his or her exposure, and can walk away from the asset whenever he/she chooses.

As far as the price of the loan, it is not clear how much the borrower is actually paying for this option. In very low interest rate environments the borrower is not paying much, if anything. Also, the utility of the option will vary by investor. An investor who exercises the put will be perceived differently by lenders when he/she next seeks a loan. So reputation risk may motivate an investor to forego this benefit.

- B. Which of the two loans would you suggest John add to the portfolio? Justify your choice.

(2 points)

From the information given, it is not clear which of the two loans Patel should add to the portfolio. Loan A is non-recourse so that purchasing this loan would be providing a put option to the borrower. The question then is whether or not the \$10 difference represents the fair value of the put option. Said differently, given that the two loans are similar in every other way, the difference in price could simply represent the premium received in writing the put option.

- C. John is considering adding leverage to his real estate portfolio. Will the existence of leverage improve real estate's diversification benefits, or dampen them? Explain.

(2 points)

Since leverage acts to short out the "debt like" behavior of the real estate portfolio, the portfolio will more closely capture the pure "equity like" behavior of real estate. When this is done, the leveraged equity behaves in a more contemporaneous fashion to the stock and bond portions of the portfolio than does unleveraged real estate. Thus, the diversification benefits of real estate, already very useful, are strengthened. Leverage further reduces the correlation relationships among the assets in the portfolio because the leveraged asset's behavior is primarily driven by the effect of the real estate cycle on the asset. Thus, if the investor sees real estate's diversification benefits as valuable, leverage is an important way to amplify these benefits.

Guideline for Short Answer Question 4

Purpose: *To introduce candidates to timber as an asset class while testing their ability to analyze a comprehensive investment issue.*

Keywords: *Commercial timberland, Plum Creek Timber, total return investment pool, timber investment management organizations, Timberland Property Index.*

Learning Objectives: *The candidate should be able to:*

- *Provide an estimate or estimates of the expected return and risk of timber as an asset class. {p. 3-4, 9}*
- *Using the data in Exhibit 6, comment on the diversification potential of timber. {p. 3-4, 7, 9}*
- *Using the data in Exhibit 6, calculate the hurdle rate for timber when added to an S&P 500 based portfolio. (Note: the hurdle rate as a risk budgeting tool was introduced in Topic 15 of Level I). {p. 9}*
- *Discuss two market imperfections that may impact the hurdle rate calculated in the above learning objective.*
- *Argue why Plum Creek may not serve as a useful benchmark for timber investment. {p. 11-2}*
- *The case asks whether or not the endowment should make an investment in timber. Make a recommendation based upon the reading of the case, the background reading you've done, and the above learning objectives. {p. 1-12}*

Nikunj Thanawala, Chief Investment Analyst for World Investment Management (WIM), is considering a role for timber in his large diversified portfolio. At the current time the main asset classes of WIM's portfolio include equities (37%), fixed income (32%), real estate (15%), private equity holdings (9%), and absolute return vehicles (7%). Nikunj is looking to enhance the portfolio's holdings in alternative investments, and is giving a serious but cautious look at timber as an asset class. He's asked his assistant to provide some historical information in order to perform some preliminary analysis. This appears in Exhibit 1.

- A. You've heard timber described as a low risk and low return asset class. Is this born out in the data? In your explanation consider timber both as an asset standing alone and as an asset as part of a large diversified portfolio.

(4 points)

The notion of timber as a low return asset class is not born out by the data. While a longer history might provide good evidence of this, the numbers over the last 15 years show timber as generating relatively high expected returns. Both proxies given in Exhibit 1 report expected returns that are greater than the other asset classes except for REITs. Moreover, as a stand alone asset, timber exhibits significant risk. The

standard deviation of Plum Creek Investments is the highest of any of the asset classes, while the standard deviation of the timberland property index is relatively high as well.

The standard deviation measures the risk of the asset or asset class in isolation. From a portfolio perspective we need to think about how the asset or asset class performs relative to other assets or asset classes. As shown by Markowitz and others, a key measure of portfolio risk is the correlation of one asset with one or more others. From the exhibit, we can see that the Timberland Property Index, or TPI, reports low correlation with all the other asset classes. For example, timber has near zero correlation with fixed income, meaning that it would be possible to add timber to a fixed income portfolio and find that the risk of the portfolio does not change. While the correlation of TPI is highest with Plum Creek (0.52), the correlation is relatively low with the S&P 500 (0.33), again pointing to the advantage of adding timber to a portfolio of stocks and bonds.

To summarize, timber appears to have high diversification potential with all of the asset classes reported in the exhibit. This would suggest that timber is a relatively safe asset to hold in this portfolio.

- B. What hurdle rate would you estimate for a timber investment? For this part you can either perform a hurdle rate analysis, or quote from a previous analysis (provide the source). List two (2) possible market imperfections that could impact this hurdle rate.

(3 points)

The following calculation is based on the hurdle rate as developed by Anson, Handbook of Alternative Assets, for timber vis-à-vis large cap stocks:

$$R_t = (R_p - R_f) * \rho_{y,p} * (\sigma_y / \sigma_p) + R_f$$

$$R_t = (0.1001 - 0.0479) * 0.33 * (0.0998 / 0.1799) + 0.0479 = 0.0575$$

This says that a timber investment must earn a rate of return of at least 5.75% to be a valuable addition to the portfolio. And so the question becomes, what can we expect to earn from our investment in timber? From the data given, we can see that in three years an investment in timber, as measured by the TPI, failed to meet its hurdle rate, but did clear its hurdle in twelve of those years. One issue that may be important is that the TPI beat the hurdle in each of the first eight years, but only in four of the last seven years. Is timber past its peak as an asset class?

Note: the estimate of the risk free rate, 4.79%, is not mentioned explicitly in the case. This is an estimate from the author of guideline based upon the rate of return on short term/intermediate term U.S. Treasury securities at the time of the case.

The case refers to two such imperfections. The first is the lockup period. We know that for timber the period of lockup is long, estimated to be between eight and 15 years. Investors will usually respond to a long lockup by increasing the return required to earn on that investment. The second is liquidity, or the ability to turn an asset quickly into cash at a fair price. Thus, once the lockup has expired, the investor may still find it difficult to move out of the investment. Similar to lockup, investors will usually respond to low liquidity by increasing the return required to be earned on the investment.

What we don't know, nor can we estimate with any degree of precision, is what an investor will demand as a result of these imperfections.

- C. Your assistant has also provided you with some data on Plum Creek Timber Company, one of the largest private timberland owners in the U.S. Some historical data on Plum Creek has been included in Exhibit 1. Provide one (1) argument why you believe Plum Creek is a good benchmark for the timber investment, and two (2) arguments why you believe it is not.

(3 points)

Yahoo Finance describes Plum Creek as follows:

Plum Creek Timber Company, Inc. operates as a real estate investment trust that owns and manages timber lands in the United States. The company engages in the sale and management of timberlands, and the sale of nonstrategic timberlands. It also produces a line of softwood lumber products, including common and select boards, studs, edge-glued boards, and finger-jointed studs. These products are targeted to domestic lumber retailers, such as retail home centers, for use in repair and remodeling projects. These products are also sold to stocking distributors for use in home construction. In addition, the company engages in the natural resource businesses that focus on opportunities relating to mineral extraction, natural gas production, and communication and transportation rights of way. As of December 31, 2004, the company owned and managed approximately 7.8 million acres of timberlands in the northwest, southern, and northeast United States, as well as owned and operated 10 wood product conversion facilities in the northwest United States. Plum Creek was formed in 1989 and is headquartered in Seattle, Washington.

Thus, one argument for Plum Creek as a good benchmark for timber investment is that timber makes up most of the products of the firm.

But we learned from the case that while Plum Creek seems to offer a general representation of timber investments, a different story emerges from the income statement and balance sheet provided in the case. From the income statement we learn that in the year ended 2004, timber provided less than 50% of the total revenues earned that year, with a majority of the revenues coming from real estate and manufacturing. In fact, Yahoo says that Plum Creek's main competition comes from two paper companies and one building company, and also classifies Plum Creek's industry as

property management. Further, we don't know if the timber revenues reported by Plum Creek were generated from harvesting or instead from strategic trading of timber prior to its harvest. Finally, from the balance sheet we see that Plum Creek operates with a substantial amount of long term debt such that financial leverage will serve to magnify the gains and losses earned year to year. And so the question is, does Plum Creek represent a pure play in timber, or is it more representative of a manufacturing and real estate holding company?

One answer to that question lies in the correlation between the return series of Plum Creek and that of the TPI. From the data in Exhibit 6 we see that the correlation is only 0.52. Further, in five of the 15 years, the returns earned by the two data series moved in opposite directions.