COURSE 6
MORNING SESSION

FINANCE AND INVESTMENTS

SECTION B—MULTIPLE CHOICE

1. You are given the following information:

Total value of the stock purchased	$20,000
Percentage margin	75%
Increase in stock price for the period	25%
Interest rate on margin loan for the period	9%
Dividends paid for the period	None

Determine the rate of return to the investor.

(A) 22.75%

(B) 30.33%

(C) 50.00%

(D) 66.67%

(E) 73.00%

USE THIS PAGE FOR YOUR SCRATCH WORK

2. You are given the following semi-annual spot rates:

$S_1 = 6.00\%$
$S_2 = 6.75\%$
$S_3 = 7.33\%$
$S_4 = 8.00\%$

Calculate the one-year implied forward rate for the second year.

(A) 7.5%

(B) 9.3%

(C) 9.7%

(D) 10.0%

(E) 10.4%

USE THIS PAGE FOR YOUR SCRATCH WORK

3. You are given the following with respect to a bond with semi-annual coupon payments priced to yield 8%:

Semi-Annual Period (t)	Payment	Present Value of Payment at Yield
1	3.00	2.89
2	3.00	2.78
3	3.00	2.67
4	3.00	2.57
5	3.00	2.47
6	103.00	81.76

Calculate the convexity of the bond.

(A) 1.29

(B) 1.58

(C) 8.78

(D) 9.50

(E) 17.56

USE THIS PAGE FOR YOUR SCRATCH WORK

4. You are given the following information with respect to a particular investor's utility function:

$U = E(r) - .01A\sigma^2$

$E(r) = 15\%$

$A = 4$

$\sigma = 25\%$

Risk free rate $= 6\%$

Calculate the difference between:

(i) the proportion of the investor's budget which will be invested in the risk free asset in order to maximize the investor's utility value; and

(ii) the reward to variability ratio.

(A) 22%

(B) 28%

(C) 36%

(D) 46%

(E) 82%

USE THIS PAGE FOR YOUR SCRATCH WORK

5. You are given the following:

Utility formula data		
Investment	E(r)	Standard Deviation
1	9	30
2	12	20
3	18	16
4	18	40
5	21	30

$U = E(r) - .005A\sigma^2$

$A = 2$

Determine which investment a risk-neutral investor would purchase.

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

USE THIS PAGE FOR YOUR SCRATCH WORK

6. Rank the following bonds based on the order of protection against early redemption (from greatest to least). All redemptions are at par value.

I. Non-callable for 5 years, callable thereafter

II. Callable immediately

III. Non-refundable for 5 years, refundable thereafter

IV. Callable immediately, non-refundable for 5 years

(A) I > III > II > IV

(B) I > III > IV > II

(C) I > IV > III > II

(D) III > I > II > IV

(E) III > I > IV > II

USE THIS PAGE FOR YOUR SCRATCH WORK

7-10. Each of questions 7 through 10 consists of an assertion in the left-hand column and a reason in the right-hand column. Code your answer to each question by blackening space:

(A) If both the assertion and the reason are true statements, and the reason is a correct explanation of the assertion.

(B) If both the assertion and the reason are true statements, but the reason is NOT a correct explanation of the assertion.

(C) If the assertion is a true statement, but the reason is a false statement.

(D) If the assertion is a false statement, but the reason is a true statement.

(E) If both the assertion and the reason are false statements.

	ASSERTION		REASON
7.	With respect to GIC portfolio management, a market-timing approach is likely to enhance returns.	BECAUSE	There is a large potential market value gain to a GIC fund by buying GICs when interest rates peak and subsequently fall.

	ASSERTION		REASON
8.	SEC Rule 144A is a popular financing technique in the high yield market.	BECAUSE	SEC Rule 144A allows issuers quick access to the market by initially selling the securities in a private placement transaction to underwriters.

	ASSERTION		REASON
9.	The price of a floating-rate note that contains a put feature is more volatile than the price of a floating-rate note without a put feature.	BECAUSE	A put feature in a floating-rate note allows the purchaser to require the issuer to repurchase the note at a specified price.

	ASSERTION		REASON
10.	The volatility of a bond's price is closely associated with its term-to-maturity.	BECAUSE	An increase in the market level of interest rates will have a much larger effect on the price of a short-term bond than on a long-term bond.

11. A fixed-rate collateralized mortgage obligation (CMO) companion class with a face amount of $300 million and a coupon of 8% is divided into a floater and an inverse floater.

The floater has a face amount of $200 million and a coupon of LIBOR+50 basis points with a cap of 10%.

Determine which of the following represents the coupon formula for the inverse floater.

(A) 15.5% - LIBOR, 6% floor

(B) 15.5% - LIBOR, 4% floor

(C) 23.0% - 2 x LIBOR, 4% floor

(D) 23.0% - LIBOR, 4% floor

(E) 24.0% - 2 x LIBOR, 6% floor

USE THIS PAGE FOR YOUR SCRATCH WORK

12-15. Each of questions 12 through 15 consists of two lists. In the list at the left are two items, lettered X and Y. In the list at the right are three items, numbered I, II, and III. ONE of the lettered items is related in some way to EXACTLY TWO of the numbered items. Indicate the related items using the following answer code:

	Lettered Item	Is Related to Numbered Items
(A)	X	I and II only
(B)	X	II and III only
(C)	Y	I and II only
(D)	Y	I and III only

(E) The correct answer is not given by (A), (B), (C) or (D).

12.

X. Z bond

Y. Accretion-directed bond

I. No reinvestment risk during the accretion phase

II. Offers a higher yield than a comparable weighted average life (WAL) Treasury zero

III. The average life does not extend even if there are no prepayments

13.

X. Gross weighted average coupon (WAC)

Y. Weighted average loan age (WALA)

I. Average of the interest rates before adjusting for the service fee

II. Approximated by taking the original term of the security and subtracting the weighted average maturity value

III. A better indicator of prepayment potential than the net coupon of the collateral

14.

X. Spot rates

Y. Forward rates

I. Single period rates

II. Yield to maturity on zero-coupon Treasury bonds

III. Term structure of these rates exhibits sharper and more sudden changes

15.

X. High yield securities

Y. High yield bank loans

I. Fixed interest rates

II. Callable immediately

III. More restrictive covenants

16. Immunization techniques assume parallel yield-curve shifts.

(A) True

(B) False

17. The duration of a pool of liabilities is equal to the market-value-weighted average duration of the individual liability components.

(A) True

(B) False

18. Convexity and aging of the insurance liability cash flows are the two primary factors which contribute to the changes in insurance liability durations.

(A) True

(B) False

19. The objective of an asset allocation analysis is to find the asset mix that provides the best expected return on the investments.

(A) True

(B) False

20. The aggregate company risk based capital (RBC) is the sum of the individual RBC risk components.

(A) True

(B) False

21. The covariance factor in the risk based capital (RBC) formula can mitigate the effect of reducing the risk components.

(A) True

(B) False

22. You have purchased a 20-year bond with a yield-to-maturity of 10% and a duration of 12 years. Immediately after your purchase, there is a shock to interest rates which shifts the yield-to-maturity of the bond to 12% and the duration of the bond to 11 years.

Assuming that the new interest rates persist indefinitely, determine the minimum holding period from the purchase date to earn at least 10%.

(A) 0 years

(B) 11 years

(C) 12 years

(D) 20 years

(E) No holding period will earn 10%

USE THIS PAGE FOR YOUR SCRATCH WORK

23. You are given the following information:

Market value of portfolio X	= \$10.0 million
Modified duration of portfolio X	= 6
Modified duration of portfolio Y	= 4

Portfolio Y has a dollar duration equal to the dollar duration of portfolio X.

Calculate the market value of portfolio Y.

(A) \$6.7 million

(B) \$10.0 million

(C) \$15.0 million

(D) \$40.0 million

(E) \$60.0 million

USE THIS PAGE FOR YOUR SCRATCH WORK

24. You are given the following information with respect to an active/immunization combination strategy for a fixed-income portfolio:

Immunizable target return	= 8%
Minimum return	= 5%
Worst case active return	= 2%

Calculate the active component of this portfolio that will ensure the minimum return.

(A) 37.5%

(B) 40.0%

(C) 50.0%

(D) 62.5%

(E) 83.3%

USE THIS PAGE FOR YOUR SCRATCH WORK

25-27. Each question 25 through 27 consists of an assertion in the left-hand column and a reason in the right-hand column. Code your answer to each question by blackening space:

(A) If both the assertion and the reason are true statements, and the reason is a correct explanation of the assertion.

(B) If both the assertion and the reason are true statements, but the reason is NOT a correct explanation of the assertion.

(C) If the assertion is a true statement, but the reason is a false statement.

(D) If the assertion is a false statement, but the reason is a true statement.

(E) If both the assertion and the reason are false statements.

	ASSERTION		REASON
25.	The risk based capital (RBC) formula rewards pooling credit risks and insurance risks.	BECAUSE	Diversifying the bond portfolio may enhance the risk based capital (RBC) ratio of the company.

	ASSERTION		REASON
26.	An investment can be prudent even if it exhibits high volatility and low expected return.	BECAUSE	Prudent investment decisions must be viewed on the basis of their effects on the portfolio as a whole.

	ASSERTION		REASON
27.	Insured asset allocation analysis assumes that the investor's risk tolerance is unchanged over time.	BECAUSE	Insured asset allocation analysis procedures are intended to adapt long term results to an investor's objectives without market timing.

28. This question consists of two lists. In the list at the left are two items, lettered X and Y. In the list at the right are four items, numbered I, II, III and IV. EACH of the lettered items is related in some way to EXACTLY TWO of the numbered items. Match the lettered items (X and Y) with the numbered items (I, II, III, and IV) shown below.

Indicate the related items using the following answer code:

	X	Y
(A)	I and II	III and IV
(B)	I and III	II and IV
(C)	I and IV	II and III
(D)	II and III	I and IV
(E)	II and IV	I and III

X. Strategic asset allocation

Y. Tactical asset allocation

I. Investment manager explicitly tries to outperform the market

II. Concerned with setting a normal long-term asset mix

III. Investment manager responds when one asset class has moved to a valuation well outside its historical range

IV. Frequent shifts between asset classes

29-30. Each question 29 through 30 consists of two lists. In the list at the left are two items, lettered X and Y. In the list at the right are three items, numbered I, II, and III. ONE of the lettered items is related in some way to EXACTLY TWO of the numbered items. Indicate the related items using the following answer code:

	Lettered Item	Is Related to Numbered Items
(A)	X	I and II only
(B)	X	II and III only
(C)	Y	I and II only
(D)	Y	I and III only

(E) The correct answer is not given by (A), (B), (C) or (D).

29.

X.	Capitalization-weighted equity market index	I.	Dow Jones Industrial Average
Y.	Capitalization-weighted bond market index	II.	Standard & Poor's 500 Index
		III.	Wilshire 5000 Index

30.

X.	Macaulay duration	I.	Accounts for interest sensitive cash flows
Y.	Option-adjusted duration	II.	Biased upward for SPDAs
		III.	Average present-value-weighted maturity of the cash flow stream

31. A multi-period securities market model can be arbitrage free even if some component single period models are not arbitrage free.

(A) True

(B) False

32. For two bond portfolios with equal market value and equal duration, if short term interest rates increase and long term interest rates decrease, the value of the "bullet" bond portfolio would increase less than the value of the "barbell" bond portfolio.

(A) True

(B) False

33. All of the following are used to determine the payoff of a "Cap" at a payment date, except:

(A) Index level

(B) Notional amount

(C) Number of days in the period

(D) Frequency of payment

(E) Strike level

34. Given that: $S(i) = \sum_{t>0} \frac{A_t}{(1+i)^t} - \sum_{t>0} \frac{L_t}{(1+i)^t}$.

Define the essence of Reddington's immunization strategy.

(A) $S(i) = 0$

(B) $S'(i) > 0$

(C) $S'(i) = 0$

(D) $S''(i) > 0$

(E) $S''(i) = 0$

USE THIS PAGE FOR YOUR SCRATCH WORK

35. Given the following information:

- The following derivatives have the same payment date.
- LIBOR is 9% at the settlement date.

Rank in ascending order (lowest to highest) the value of a single payment of the following derivatives.

I. A floor indexed on LIBOR plus 50 basis points, strike price 11%, notional amount $100,000

II. A collar indexed on LIBOR plus 100 basis points, strike prices 8% and 11%, notional amount $100,000

III. A cap indexed on LIBOR plus 50 basis points, strike price 8%, notional amount $125,000

IV. A corridor indexed on LIBOR plus 0 (zero) basis points, strike prices 8% and 11%, notional amount $200,000

(A) I < IV < III < II

(B) II < I < III < IV

(C) II < III < IV < I

(D) IV < I < II < III

(E) IV < II < I < III

USE THIS PAGE FOR YOUR SCRATCH WORK

36-40. Each question 36 through 40 consists of an assertion in the left-hand column and a reason in the right-hand column. Code your answer to each question by blackening space:

(A) If both the assertion and the reason are true statements, and the reason is a correct explanation of the assertion.

(B) If both the assertion and the reason are true statements, but the reason is NOT a correct explanation of the assertion.

(C) If the assertion is a true statement, but the reason is a false statement.

(D) If the assertion is a false statement, but the reason is a true statement.

(E) If both the assertion and the reason are false statements.

	ASSERTION		REASON
36.	A callable bond will trade at a higher price than a comparable optionless bond.	BECAUSE	The price appreciation potential of a callable bond is limited.

	ASSERTION		REASON
37.	Asset default risk does not contribute to interest rate risk.	BECAUSE	An asset default results in the loss of all future cash flows.

	ASSERTION		REASON
38.	There is interest rate risk present if a company's investment strategy allows trading between different sectors of a fixed income market.	BECAUSE	Interest spreads between different securities within a particular sector of the market may change over time.

	ASSERTION		REASON
39.	The investment strategy used in C-3 testing has a limited number of choices.	BECAUSE	Interest rate generators used for interest rate risk analysis are arbitrage free.

	ASSERTION		REASON
40.	A valuation model used for mortgage backed securities is often adjusted by adding at each node an option-adjusted spread (OAS) to the short rates.	BECAUSE	Many mortgage borrowers do not optimally exercise their privilege to refinance their loans.

41-42. Each question 41 through 42 consists of two lists. In the list at the left are two items, lettered X and Y. In the list at the right are three items, numbered I, II, and III. ONE of the lettered items is related in some way to EXACTLY TWO of the numbered items. Indicate the related items using the following answer code:

	Lettered Item	Is Related to Numbered Items
(A)	X	I and II only
(B)	X	I and III only
(C)	Y	I and II only
(D)	Y	II and III only

(E) The correct answer is not given by (A), (B), (C) or (D).

41. In the Orstein-Uhlenbeck mean reverting process:

X. The drift term

Y. The variance term

I. The diffusion process.

II. The long run equilibrium rate of interest.

III. The measure of interest rate volatility.

42.

X. Real estate investment

Y. Fixed income derivative

I. Volatility of return is often uncorrelated to interest rate volatility.

II. May be appropriate for investment of surplus assets.

III. Useful for correcting asset-liability mismatch positions.

**** END OF EXAMINATION 6 ****
MORNING SESSION

Course 6
May 2000

Multiple-Choice Answer Key

1	B
2	B
3	C
4	D
5	E
6	B
7	E
8	A
9	D
10	C
11	C
12	A
13	E
14	D
15	E
16	A
17	A
18	A
19	B
20	B
21	A
22	C
23	C
24	C
25	B
26	A
27	D
28	D
29	B
30	B
31	B
32	A
33	D
34	C
35	B
36	D
37	E
38	A
39	C
40	A
41	E
42	A