Econ435 – Financial Markets and the Macroeconomy

Fall 2005

Final Exam

The exam consists of 60 multiple choice questions and one essay question. Please answer ALL of them.

The duration of the exam is 2 hrs. DO NOT OPEN the exams until you are told to do so and STOP writing when you are told that the exam is over. Failure to comply will result in a 10% loss in the grade.

Do not forget to write your name and university ID number, as well as the color of your exam, on the scantron.

NO PROGRAMMABLE OR FINANCIAL CALCULATORS ARE ALLOWED. Only simple or scientific calculators can be used.

GOOD LUCK!

1. The ____________ refers to the potential conflict between management and shareholders due to management's control of pecuniary rewards as well as the possibility of incompetent performance by managers.
   A) principal-agent problem
   B) diversification problem
   C) liquidity problem
   D) solvency problem
   E) regulatory problem

2. Which of the following is **true** of the Dow Jones Industrial Average?
   A) It is a value-weighted average of 30 large industrial stocks.
   B) It is a price-weighted average of 30 large industrial stocks.
   C) The divisor must be adjusted for stock splits.
   D) A and C.
   E) B and C.

3. Suppose the price of a share of IBM stock is $100. An April call option on IBM stock has a premium of $5 and an exercise price of $100. Ignoring commissions, the holder of the call option will earn a (positive) profit if the price of the share
   A) increases to $104.
   B) decreases to $90.
   C) increases to $105.
   D) decreases to $96.
   E) none of the above.

4. Before expiration, the time value of an in the money stock option is always
   A) equal to zero.
   B) positive.
   C) negative.
   D) equal to the stock price minus the exercise price.
   E) none of the above.

5. With regard to a call option contract on a stock, the short position is held by
   A) the trader who bought the contract at the largest discount.
   B) the trader who has to travel the farthest distance to deliver the stock.
   C) the trader who plans to hold the contract for the lengthiest time period.
   D) the trader who has the right to purchase the stock on the delivery date.
   E) the trader who commits to selling the stock on the delivery date.

6. A put option on a stock is said to be out of the money if
   A) the exercise price is higher than the stock price.
   B) the exercise price is less than the stock price.
   C) the exercise price is equal to the stock price.
   D) the price of the put is higher than the price of the call.
   E) the price of the call is higher than the price of the put.

7. Other things equal, the price of a stock call option is positively correlated with the following factors **except**
   A) the stock price.
   B) the time to expiration.
   C) the stock volatility.
   D) the exercise price.
   E) none of the above.

8. A single-index model uses __________ as a proxy for the systematic risk factor.
   A) a market index, such as the S&P 500
   B) the current account deficit
   C) the growth rate in GNP
   D) the unemployment rate
   E) none of the above

Use the following to answer questions 9-10:

Your client, Bo Regard, holds a complete portfolio that consists of a portfolio of risky assets (P) and T-Bills. The expected return on the risky portfolio P is 12%, its standard deviation is 7.20%, and the risk-free rate of return is 3.60%. Bo's complete portfolio is has weights equal to 80% for the risky portfolio P and 20% for T-Bills.

9. What is the slope of Bo's Capital Allocation Line?
   A) 3.6
   B) 1.167
   C) 12.0
   D) 0.2
   E) 0.857

10. What is the standard deviation of Bo's complete portfolio?
    A) 7.20%
    B) 5.40%
    C) 6.92%
    D) 4.98%
    E) 5.76%

11. Which of the following statements is **true** about risk-averse individuals:
    A) They require a positive risk-premium.
    B) They evaluate risky projects based only on expected returns.
    C) They prefer higher risk projects to lower risk projects.
    D) Both A and C.
    E) None of the above.

12. You sold short 100 shares of common stock at $45 per share. The initial margin is 50%. Your initial investment was
    A) $4,800.
    B) $12,000.
    C) $2,250.
    D) $7,200.
    E) none of the above.

13. Security X has expected return of 14% and standard deviation of 22%. Security Y has expected return of 16% and standard deviation of 28%. If the two securities have a correlation coefficient of 0.8, what is their covariance?
    A) 0.038
    B) 0.049
    C) 0.018
    D) 0.013
    E) 0.054

14. You purchased 100 shares of XON common stock on margin at $60 per share. Assume the initial margin is 50% and the maintenance margin is 30%. Below what stock price level would you get a margin call? Assume the stock pays no dividend; ignore interest on margin.
    A) $42.86
    B) $50.75
    C) $49.67
    D) $80.34
    E) none of the above

15. A common strategy for passive management is ____________.
    A) creating an index fund
    B) creating a small firm fund
    C) creating an investment bank
    D) A and C
    E) B and C

16. In a typical underwriting arrangement the investment banking firm

    I) sells shares to the public via an underwriting syndicate.
    II) purchases the securities from the issuing company.
    III) assumes the full risk that the shares may not be sold at the offering price.
    IV) agrees to help the firm sell the issue to the public but does not actually purchase the securities.
    A) I, II, and III
    B) I, III, and IV
    C) I and IV
    D) II and III
    E) I and II

17. The measure of risk in the framework of the mean-variance frontier is:
    A) specific risk.
    B) standard deviation of returns.
    C) reinvestment risk.
    D) market risk.
    E) none of the above.

18. The price that the buyer of a call option pays for the underlying asset if she executes her option is called the
    A) strike price.
    B) exercise price.
    C) execution price.
    D) A or C.
    E) A or B.

19. Consider a well-diversified portfolio, A, in a two-factor economy. The risk-free rate is 5%, the risk premium on the first factor portfolio is 4% and the risk premium on the second factor portfolio is 6%. If portfolio A has a beta of 0.6 on the first factor and 1.8 on the second factor, what is its expected return?
    A) 7.0%
    B) 8.0%
    C) 18.2%
    D) 13.0%
    E) 13.2%

20. Which of the following sayings illustrates the concept of diversification?
    A) Don't throw the baby out with the bathwater.
    B) A stitch in time saves nine.
    C) Neither a borrower nor a lender be.
    D) Don't put all your eggs in one basket.
    E) Out of sight, out of mind.

21. If a market proxy portfolio consistently beats all professionally managed portfolios on a risk-adjusted basis, it may be concluded that
    A) the CAPM is valid.
    B) the market proxy is mean/variance efficient.
    C) the CAPM is invalid.
    D) A and B.
    E) B and C.

22. Consider the single-index model. The alpha of a stock is 0%. The return on the market index is 16%. The risk-free rate of return is 5%. The stock earns a return that exceeds the risk-free rate by 11% and there are no firm-specific events affecting the stock performance. The ß of the stock is _______.
   A) 0.67
   B) 0.75
   C) 1.0
   D) 1.33
   E) 1.50

23. Suppose you held a well-diversified portfolio with a very large number of securities, and that the single index model holds. If the σ of your portfolio was 0.25 and σ_M was 0.21, the ß of the portfolio would be approximately ________.
   A) 0.64
   B) 1.19
   C) 1.25
   D) 1.56
   E) none of the above

24. Assume that a security is fairly priced (i.e., CAPM holds) and has an expected rate of return of 17%. The market expected rate of return is 11% and the risk-free rate is 4%. The beta of the stock is ___?
   A) 1.25
   B) 1.86
   C) 1
   D) 0.95
   E) none of the above.

25. The fee that mutual funds use to help pay for advertising and promotional literature is called a
   A) front-end load fee.
   B) back-end load fee.
   C) operating expense fee.
   D) 12b-1 fee.
   E) structured fee.

26. **Delta** is defined as
   A) the change in the value of an option for a dollar change in the price of the underlying asset.
   B) the change in the value of the underlying asset for a dollar change in the call price.
   C) the percentage change in the value of an option for a one percent change in the value of the underlying asset.
   D) the change in the volatility of the underlying stock price.
   E) none of the above.

27. The maximum loss the writer of a stock put option can suffer is equal to
    A) the put premium.
    B) the strike price.
    C) the stock price minus the put premium.
    D) the strike price minus the put premium.
    E) none of the above.

28. In the context of the Capital Asset Pricing Model (CAPM) the relevant measure of risk is
    A) unique risk.
    B) beta.
    C) standard deviation of returns.
    D) variance of returns.
    E) none of the above.

29. The feature of the APT that offers the greatest potential advantage over the CAPM is the _______________.
    A) use of several factors instead of a single market index to explain the risk-return relationship
    B) identification of anticipated changes in production, inflation and term structure as key factors in explaining the risk-return relationship
    C) superior measurement of the risk-free rate of return over historical time periods
    D) variability of coefficients of sensitivity to the APT factors for a given asset over time
    E) none of the above

30. The intrinsic value of an in-the-money put option is equal to
    A) the stock price minus the exercise price.
    B) the put premium.
    C) zero.
    D) the exercise price minus the stock price.
    E) none of the above.

31. Which statement is **not** true regarding the market portfolio?
    A) It includes all publicly traded financial assets.
    B) It lies on the efficient frontier.
    C) All securities in the market portfolio are held in proportion to their market values.
    D) It is the tangency point between the capital market line and the indifference curve.
    E) All of the above are true.

32. A security has an (actual) expected rate of return of 15% and a beta of 1.25. The market expected rate of return is 10% and the risk-free rate is 4%. The alpha of the stock is
    A) 1.7%.
    B) -1.7%.
    C) 8.3%.
    D) 3.5%.
    E) none of the above.

33. The weak form of the efficient market hypothesis asserts that
    A) stock prices do not rapidly adjust to new information contained in past prices or past data.
    B) future changes in stock prices cannot be predicted from past prices.
    C) chartists cannot expect to outperform the market.
    D) A and B
    E) B and C

34. The nonsystematic risk of a specific security
    A) is likely to be higher in an increasing market.
    B) results from factors unique to the firm.
    C) depends on market volatility.
    D) cannot be diversified away.
    E) none of the above.

Use the following to answer questions 35-36:

State of the Market	**Probability**	**Return on Indigo Engines Inc.**	**Return on Taupe Tables Inc.**
High	0.7	14%	22%
Low	0.3	6%	3%

35. What is the expected return on a portfolio that has 60% in Indigo Engines and 40% in Taupe Tables?
    A) 11.96%
    B) 8.41%
    C) 10.62%
    D) 14.73%
    E) 13.48%

36. What are the expected returns of Indigo Engines and Taupe Tables, respectively?
    A) 9.7% and 15.2%
    B) 10.1% and 17.4%
    C) 11.6% and 16.3%
    D) 8.4% and 6.8%
    E) 12.5% and 13.9%

37. The CAPM applies to
    A) portfolios of securities only.
    B) individual securities only.
    C) efficient portfolios of securities only.
    D) efficient portfolios and efficient individual securities only.
    E) all portfolios and individual securities.

38. Based on their relative degrees of risk tolerance
    A) investors will hold varying amounts of the risky asset in their portfolios.
    B) all investors will have the same portfolio asset allocations.
    C) investors will hold varying amounts of the risk-free asset in their portfolios.
    D) A and C.
    E) none of the above.

39. Which of the following functions do mutual fund companies perform for their investors?
    A) Record keeping and administration
    B) Diversification and divisibility
    C) Professional management
    D) Lower transaction costs
    E) All of the above.

40. According to Roll, the only testable hypothesis associated with the CAPM is
    A) the number of ex post mean-variance efficient portfolios.
    B) the exact composition of the market portfolio.
    C) whether the market portfolio is mean-variance efficient.
    D) the SML relationship.
    E) none of the above.

41. Consider the one-factor APT (i.e., the single-factor model). The variance of returns on the factor portfolio is 6%. The beta of a well-diversified portfolio on the factor is 1.1. The variance of returns on the well-diversified portfolio is approximately __________.
    A) 3.6%
    B) 6.0%
    C) 7.3%
    D) 10.1%
    E) none of the above

42. In the context of the Arbitrage Pricing Theory, as a well-diversified portfolio becomes larger its nonsystematic risk approaches
    A) one.
    B) infinity.
    C) zero.
    D) negative one.
    E) none of the above.

43. The risk-free rate and the expected market rate of return are 6% and 12%, respectively. According to the capital asset pricing model (CAPM), the expected rate of return on security X with a beta of 1.2 is equal to
   A) 6%.
   B) 14.4%.
   C) 12%.
   D) 13.2%.
   E) 18%.

44. An American put option can be exercised
   A) any time on or before the expiration date.
   B) only on the expiration date.
   C) any time in the indefinite future.
   D) only after dividends are paid.
   E) none of the above.

45. To the option holder, put options are worth ______ when the exercise price is higher; call options are worth ______ when the exercise price is higher.
   A) more; more
   B) more; less
   C) less; more
   D) less; less
   E) It doesn't matter – they are too risky to be included in a reasonable person's portfolio.

46. For a taxpayer in the 25% marginal tax bracket, a 20-year municipal bond currently yielding 5.5% would offer an equivalent taxable yield of:
   A) 7.33%.
   B) 10.75%.
   C) 5.5%.
   D) 4.125%.
   E) none of the above.

47. Proponents of the EMH typically advocate
   A) an active trading strategy.
   B) investing in an index fund.
   C) a passive investment strategy.
   D) A and B
   E) B and C

48. Assume that you purchased 200 shares of Super Performing mutual fund at a net asset value of $21 per share. During the year you received dividend income distributions of $1.50 per share and capital gains distributions of $2.85 per share. At the end of the year the shares had a net asset value of $23 per share. What was your rate of return on this investment?
   A) 30.24%
   B) 25.37%
   C) 27.19%
   D) 22.44%
   E) 29.18%

49. A European call option can be exercised
   A) any time in the future.
   B) only on the expiration date.
   C) if the price of the underlying asset declines below the exercise price.
   D) immediately after dividends are paid.
   E) none of the above.

50. According to the Capital Asset Pricing Model (CAPM), fairly priced securities
   A) have positive betas.
   B) have zero alphas.
   C) have negative betas.
   D) have positive alphas.
   E) none of the above.

51. According to the Capital Asset Pricing Model (CAPM), the expected rate of return on any security is equal to
   A) $r_f + ß [E(r_M)]$.
   B) $r_f + ß [E(r_M) - r_f]$.
   C) $ß [E(r_M) - r_f)]$.
   D) $E(r_M) + r_f$.
   E) none of the above.

52. If you believe in the ________ form of the EMH, you believe that stock prices reflect all relevant information including historical stock prices and current public information about the firm, but not information that is available only to insiders.
   A) semistrong
   B) strong
   C) weak
   D) A, B, and C
   E) none of the above

53. An example of a primitive security is __________.
  A) a common share of General Motors
  B) a call option on Mobil stock
  C) a call option on a stock of a firm based in a Third World country
  D) a U. S. government bond
  E) A and D

54. Given an optimal risky portfolio with expected return of 16% and standard deviation of 20% and a risk free rate of 4%, what is the slope of the best feasible CAL?
  A) 0.60
  B) 0.14
  C) 0.08
  D) 0.36
  E) 0.36

55. The market portfolio has a beta of
  A) 0.
  B) 1.
  C) -1.
  D) 0.5.
  E) none of the above

56. The standard deviation of a portfolio that has 20% of its value invested in a risk-free asset and 80% of its value invested in a risky asset with a standard deviation of 20% is ____%.
  A) 18
  B) 14
  C) 12
  D) 20
  E) 16

57. The Capital Allocation Line can be described as the
  A) investment opportunity set formed with a risky asset and a risk-free asset.
  B) investment opportunity set formed with two risky assets.
  C) line on which lie all portfolios that offer the same utility to a particular investor.
  D) line on which lie all portfolios with the same expected rate of return and different standard deviations.
  E) none of the above.

58. A mutual fund had year-end assets of $327,000,000 and liabilities of $46,000,000. If the fund NAV was $30.48, how many shares must have been held in the fund?
  A) 11,354,751
  B) 8,412,642
  C) 10,165,476
  D) 9,165,414
  E) 9,219,160

59. A protective put strategy is
    A) a long put plus a long position in the underlying asset.
    B) a long put plus a long call on the same underlying asset.
    C) a long call plus a short put on the same underlying asset.
    D) a long put plus a short call on the same underlying asset.
    E) none of the above.

60. An arbitrage opportunity exists if an investor can construct a __________ investment portfolio that will yield a sure profit.
    A) positive
    B) negative
    C) zero
    D) all of the above
    E) none of the above

Question 1

(i) Choose three investment strategies based on options and describe how to construct them, calculate their payoff and profit, and graph the payoff and profit functions.

(ii) The evolution of the stock market is shown in the table below:

	Year 0		Year 1	
	Price	No. of shares	Price	No. of shares
Stock A	15	150	14	150
Stock B	21	100	8	300
Stock C	24	230	20	230

Calculate the price-weighted index for years 0 and 1 (notice that there is a 3-for-1 stock split for stock B).

Question 2 (*extra credit – 15 points*)

Enumerate and describe the market anomalies discussed in class and the way they violate the Efficient Market Hypothesis (that is, which version of the hypothesis is violated – don't forget to define this version of the EMH).