

Sample Midterm Questions
Foundations of Financial Markets
Summer 2007, Section 1
Total exam time: 1 hour and 30 minutes

1. If you can get 7.75% return on in 10 years from your local bank, would it be wise to invest in a 10 year, \$1000 par value zero coupon bond that costs \$475? (Assume both are equally risky)
 - (a) Yes, the yield of the bond is greater
 - (b) No, the yield of the bond is less
 - (c) Can't tell from information given
2. According to portfolio theory, which of the following is NOT TRUE?
 - (a) All systematic risk can be diversified away
 - (b) All non-systematic risk can be diversified away
 - (c) Diversification lowers the potential risk of the portfolio
3. Which of the following statements about short selling a risk-free security is true:
 - (a) It is impossible to short sell risk-free securities
 - (b) Even combined with other securities, the short sale makes no sense
 - (c) This transaction is in principle equivalent to borrowing money
 - (d) This transaction is in principle equivalent to lending money
4. When we put 2 risky securities into a portfolio, we have the diversification benefit:
 - (a) Only if the correlation between the 2 securities is equal to 0
 - (b) Only if the correlation between the 2 securities is negative
 - (c) As long as the correlation between the 2 securities is less than 1
 - (d) If the variance of 1 security is lower than the other security
5. You purchase a stock for \$100. In 4 months you receive a dividend of \$3 and sell the stock for \$102. What is your annual holding period return?
 - (a) 5%
 - (b) 10.21%
 - (c) 15.76%
 - (d) 20%
6. To buy 100 shares of IBM at \$100, you borrow \$4000 from your broker and pay the rest yourself. One month later, the price drops to \$50. What is your margin one month later?

- (a) 0.6
 - (b) 0.2
 - (c) 0.1
 - (d) None of the above
7. Which of the following is true about risk averse investor?
- (a) They care only about risk
 - (b) They care only about returns
 - (c) They might hold a risky security as part of a portfolio even if its expected return is less than the risk-free rate
 - (d) They prefer a risk-free security to a risky security
8. Suppose the beta of Yahoo stock is 3.2, the risk free rate is 3% and expected return on the market portfolio is 12%. If CAPM holds and the expected return on Yahoo is 30% then the alpha of Yahoo's stock is (1 pt)
- (a) positive.
 - (b) negative.
 - (c) zero.
 - (d).Not enough information to answer.
9. Assume CAPM is correct. There is a security with expected return 21% and standard deviation of return 32%. Risk free rate is 5%, and return on market portfolio is 13%. What is the beta of this security?
- (a) 1
 - (b) 2
 - (c) 0.5
 - (d). None of the above
10. Suppose Apple's stock has a standard deviation of 40% and beta of 1.4. The standard deviation on the market portfolio is 15%. Which of the following statements about the risk of Apple's stock is true? (1 pt)
- (a) The fraction of systematic risk is bigger than the fraction of non-systematic risk.
 - (b) The fraction of systematic risk is smaller than the fraction of non-systematic risk.
 - (c) The systematic risk is equal to the non-systematic risk.
 - (d) There is not enough information.

11. Suppose Kim and Susan care only about the mean and standard deviation of their portfolio return. Kim is less risk averse than Susan. Suppose that Susan holds the tangency portfolio. Which portfolio might Kim hold?
 - (a) The riskfree asset
 - (b) The tangency portfolio
 - (c) The tangency portfolio leveraged by the risk-free asset
 - (d) None of the above

12. John and Jim are both risk averse and only care about the mean and standard deviation of their portfolio return. They agree on the opportunity set available, and on the expected returns and variances of all assets. Which of the following statements is correct?
 - (a) John and Jim must hold the same portfolio of all assets.
 - (b) John and Jim may hold completely different portfolios of risky assets.
 - (c) When choosing an asset to add to their portfolios, John and Jim always prefer the one with the lowest standard deviation.
 - (d) John holds any two risky assets in the same ratio as Jim does in his portfolio.

13. Which of the following best explains a decline in a dealer's inventory:
 - (a) bid price and ask price are too high
 - (b) bid price is too high and ask price is too low
 - (c) bid price is too low and ask price is too high
 - (d) bid price and ask price are too low

14. What is the effective annual rate corresponding to an APR of 40% with weekly compounding (assume there are 52 weeks for a year)?
 - (a) 34.23%
 - (b) 52.12%
 - (c) 48.95%
 - (d) 42.88%

Please show in detail how you get the results for the following questions:

15. What is the expected return on a two asset portfolio, where you invest 150% of your net worth in A, with a mean return of 10%, and borrow 50% of your net worth by selling short B, which has a mean return of 6%?

16. Assume the volatility of IBM stock is .16 and the volatility of Microsoft stock is .25. The correlation between IBM stock return and Microsoft stock return is 0.7. What is the volatility of an equally weighted portfolio of these 2 stocks?

Suppose that among many stocks in the market there are two securities, A and B, with the following characteristics: A has mean .08 and $\sigma = .4$ and B has mean .13 and $\sigma = .6$. The correlation between these two is $\rho = -1$. You form a portfolio of these 2 securities.

17. Assuming you must hold positive amounts of both securities, what fraction of the portfolio should you hold in security A to reduce the risk of the portfolio to zero?

18. If it is possible to borrow and lend at the risk-free rate, R_f , then what must the equilibrium risk-free rate be?

19. Consider the following data of mutual funds:

	expected return	volatility
fund A	16%	12%
fund B	14%	10%
fund C	12%	8%

The rate on T-bills is 6%. Which of the above funds would you prefer to hold in

combination with T-bills and why?

20. Suppose you have purchased a 2-year coupon bond with face value of \$1000, the bond pays \$60 **semi-annual** coupon, i.e. the bond will pay \$60 every half year, and also pay the face value \$1000 in 2 years. What is the fair price of the bond today if the appropriate quoted annual percentage rate (APR) is 6% and interest is compounded semi-annually? (2 pts)

ANSWERS

1. B
2. A
3. C
4. C
5. C
6. B
7. C
8. B
9. B
10. B
11. C
12. D
13. D
14. C
15. 12%
16. 18.98%
17. 0.6
18. 10%
19. Fund A, because it has the largest Sharpe Ratio
20. Since the bond is a **semi-annual** coupon bond, we need to first transform the quoted rate to the effective annual rate (EAR) is

$$EAR = \left(1 + \frac{APR}{2}\right)^2 - 1 = 0.0609$$

Then the price of the coupon bond is the present value of the future payments:

$$\begin{aligned} p &= \frac{60}{(1 + 0.0609)^{0.5}} + \frac{60}{1 + 0.0609} + \frac{60}{1.0609^{1.5}} + \frac{1060}{1.0609^2} \\ &= \$1111.51 \end{aligned}$$