# SAMPLE MID-TERM QUESTIONS

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## HOW TO PREPARE FOR THE MID- TERM:

1. Study in a group
2. Review the concept questions in the Before and After book
3. When you review the questions listed below, make certain that you know WHY the wrong answers are wrong in addition to knowing the correct answer.
4. Before answering a question try to identify the framework or model or picture or equation from our classroom discussion (or from the homeworks) that are relevant to the question.
5. Change a word or phrase in the question and then discuss whether and how the correct answer changes.
6. Take all questions seriously AND think before you answer.

## EASY QUESTIONS:

1. Assuming that the proceeds of each year are reinvested in the following years, calculate the average annual return from the following sequence of returns:
YR 1 = +.20, YR 2 = -.15, YR 3 = +.10, YR 4 = +.06

       (a) .1263         (b) .0525         (c) .0835         (d) .0443

2. According to modern portfolio theory, the idea that investors with different indifference curves will hold the same portfolio of risky securities is a result of:
       (a) diminishing marginal utility of income
       (b) covariance
       (c) the separation theorem
       (d) the normal distribution assumption

3. Within the framework of modern portfolio theory, if portfolios A and B have the same return but portfolio A has less risk, then:
       (a) portfolio B is inefficient         (b) portfolio A is inefficient
       (c) portfolio B cannot exist         (d) you must hold both A and B

4. The law of diminishing marginal utility of income implies:
       (a) securities returns are serially uncorrelated
       (b) people are risk averse
       (c) the law of large numbers
       (d) all of the above

5. In a portfolio where you own positive amounts of two risky assets, the standard deviation of the portfolio cannot be reduced below the standard deviation of the lower risk asset if the correlation of returns between the two assets is:
       (a) 0         (b) 1.0         (c) -1.0         (d) none of the above

6. According to modern portfolio theory, a risk neutral investor will choose an optimal portfolio
        (a) to maximize risk                (b) to maximize return
        (c) to minimize risk                 (d) any of the above


7. If interest rate parity holds, what is the one-year forward price of the British
Pound, assuming that the current exchange rate is \$1.60/£, the British one-year interest
rate is 7% (expressed as an Effective Annual Rate) and the U.S. one-year rate is 9% (also
expressed as an Effective Annual Rate)?
(a) £0.61
(b) \$1.57
(c) \$1.63
(d) Not enough information has been provided.


8. The capital allocation line will be a straight line:
        (a) when investors can borrow and lend at the risk free rate
        (b) when investors are risk neutral
        (c) when securities have zero covariance
        (d) when the risk free asset has the highest return of any security
        (e) all of the above


9.Within the framework of the supply and demand for credit, government deficits lead to:

    a) An inward shift in the demand curve, and therefore increased interest rates.
    b) An inward shift in the demand curve, and therefore decreased interest rates.
    c) An outward shift in the demand curve, and therefore increased interest rates.
    d) An outward shift in the demand curve, and therefore decreased interest rates.


10. In a portfolio consisting of the risk free asset and/or a risky asset, what is the expected return if you
borrow 25% of your net worth by selling short the risk free asset and invest the proceeds in the risky asset,
given the following?

        $R_m = .15$
        $R_f = .05$
        $\sigma_m = .2$

        a.   .2
        b.   .1875
        c.   .175
        d.   .15
        e.   .05

11. An NYSE specialist holds a call auction:

    a) whenever there are more buy orders than sell orders
    b) at the opening of the market every day
    c) whenever there are more limit orders than market orders
    d) if the specialist has a short inventory position


12. According to the CAPM, the best capital allocation line:

a) is tangent to the efficient frontier of risky securities
b) has the highest reward to variability ratio (price of risk)
c) is comprised of efficient portfolios
d) all of the above

13. Suppose two portfolios have the same average return, the same standard deviation of return but portfolio A has a higher beta than portfolio B. According to the Sharpe ratio, portfolio A's performance is:

a) better than B
b) poorer than B
c) the same as B
d) not enough information is given

14 . You are given the following Government bond yields:  one year U.S. dollar denominated bonds are 5 percent and one year Swiss franc denominated bonds are 3 percent.  If the current exchange rate is 1.65 Swiss francs per U.S. dollar, what is the exchange rate of francs per dollar in one year at which you will break even on the risky arbitrage of borrowing in Swiss francs at 3 percent today, lending in U.S. dollars at 5 percent today and reversing the transaction in one year.

(a) 1.6820          (b) 1.6186          (c) 1.6500          (d) 1.5728

15. According to the mean-variance criterion (principle of dominance), which of the following investments dominates the others ($\mu$ = mean return, $\sigma$ = standard deviation of return):
    (a) $\mu$ = .15,      $\sigma$ = .2
    (b) $\mu$ = .10,      $\sigma$ = .2
    (c) $\mu$ = .10,      $\sigma$ = .25
    (d) $\mu$ = .15,      $\sigma$ = .25

**HARDER QUESTIONS:**

16.  Security A has higher equilibrium price volatility and higher volume of trading than security B.  If everything else were the same, the equilibrium bid-ask spread of A must be:
        a. Greater than B
        b. Less than B
        c. Equal to B
        d. It is impossible to tell

17.  If you can get a 7.75% return on money invested for 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 YTM is greater
        b.  No, the YTM is less
        c.   Can't tell from information given

18. Which of the following lowers the equilibrium nominal interest rate (all else the same)?
        a.  A decrease in expected inflation
        b.  An increase in household saving

c. An increase in government spending
d. a and b

19. 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%
      a. 8%
      b. 18%
      c. 120%
      d. 12%
      e. None of the above

20. The standard deviation of a two-security portfolio will be less than a linear combination of the two component security standard deviations:
      a. As long as the correlation coefficient of returns is less than 1
      b. Only if the correlation coefficient of returns is equal to zero
      c. If the variance of the added security is lower than the other securities in the portfolio
      d. None of the above

21. According to the CAPM, a security has an equilibrium expected return less than that of the risk-free asset when:
      a. Its correlation coefficient with the market is less than 1
      b. When it has a beta of zero
      c. A security never has an equilibrium expected return less than the risk free asset
      d. None of the above

22. According to modern 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
      d. None of the above

23. Suppose you buy a ten year $1000 face value zero coupon bond whose yield to maturity (annual compounding) is 7 percent. You sell the bond exactly two years later, when the yield to maturity is 10 percent. What is the price change per $1000 bond?

    (a) +$73.67     (b) +$31.84     (c) -$41.84     (d) -$73.67

24. Suppose you have a two asset portfolio with $s_1 = .05$ and $s_2 = .08$. Assume the correlation coefficient of returns on the two assets is -1.0. Assuming you must hold positive amounts of both securities, what fraction of the portfolio should you hold in asset 2 to reduce the risk of the portfolio to zero.

    (a) .62        (b) .5        (c) .42        (d) .38

25. If your objective is to reduce the standard deviation of returns on a portfolio by the greatest amount, you should add a security:
      a. that has a lower standard deviation of returns than other securities in the portfolio
      b. That has a beta less than one
      c. That has returns that are uncorrelated with the returns on all other securities in the portfolio
      d. That has returns that are positively correlated with the returns on other securities in the portfolio

26. Which of the following statements about a one-year short sale of U.S. one-year Government bonds is true:
      a. It is impossible to sell short U.S. Government bonds for more than six months
      b. Even combined with other securities, the short sale makes no sense unless you expect to buy back
           the Government bonds after the price declines
      c. This transaction is functionally equivalent to borrowing money for one year

d. This transaction will be profitable only if yields fall in the future

27. If a Treasury bill pays 5%, which of the following would definitely not be chosen by a risk averse investor:
    a. An asset paying 10%, with probability .6 or 2% with probability .4
    b. An asset paying 1O% with probability .4 or 2% with probability .6
    c. An asset paying 1O% with probability .2 *or* 3.75% with probability. 8
    d. An asset paying 10% with probability .3 or 3.75% with probability .7

28. The <u>equilibrium</u> market price of risk
    a. Is higher when investors are more risk averse
    b. Is fixed by the risk-free rate
    c. Cannot be greater than one
    d. All of the above

29. Which of the following is true about a risk averse investor?
    a. They care only about risk
    b. They care only about returns
    c. They might hold a risky security even if its expected return is less than the risk-free rate
    d. They prefer a risk-free security to a risky security

30. If the (positive) yield to maturity on a zero coupon bond is constant from one year to the next, the price of the zero coupon bond over the next year will
    a. Increase
    b. Decrease
    c. Remain the same
    d. You cannot tell

**HARDEST QUESTIONS:**

31. According to the CAPM, if a security's beta is negative its expected return must be
    a. The market rate of return
    b. Zero
    c. A negative rate of return
    d. The risk free rate
    e. None of the above

32. A portfolio consisting of positive amounts of two securities with positive standard deviations but with a correlation of returns equal to zero has a global minimum variance portfolio that has a standard deviation:
    a. Equal to a weighted average of the standard deviations of the two securities
    b. Equal to -1
    c. Equal to 0
    d. Greater than 0

33. The law of one price implies
    a. Higher risk requires higher returns
    b. All zero coupon bonds have the same yield
    c. All risky securities have returns greater than the risk free rate
    d. Two well-diversified portfolios with the same beta should have the same expected return

34. Assume that transactions costs are zero and there is no credit risk in any transaction. If the price of CATS is $88 (per 100 fact value) and the price of TIGRS is $87.50 and borrowing (lending) either security costs (earns) $1.00 per $ 100 (and that fee is fixed through the maturity date of the security), identify how you would construct (if possible) a profitable and riskless transaction.

Check one entry in each line (all must be correct)

|   |   | (a) | (b) | (c) |
|---|---|-----|-----|-----|
| 1. | TIGRS | Buy__ | Sell Short __ | Do Nothing__ |
| 2. | TIGRS | Lend__ | Borrow__ | Do Nothing__ |
| 3. | CATS | Buy__ | Sell Short__ | Do Nothing__ |
| 4. | CATS | Lend__ | Borrow__ | Do Nothing__ |

35. Under what circumstances will a portfolio allocation of 25% in asset 1 and 75% in asset 2 produce a standard deviation (SD) for the combined portfolio equal to 25%, assuming SD(1) = 10% and SD(2) = 30% :

(a)Rho = 0     (b) Rho = 1     (c)Rho = -1     (d) None of the above

36. The *primary* risk involved in an "uncovered interest arbitrage" transaction is:
   a. The foreign currency will fluctuate
   b. The foreign interest rate will fluctuate
   c. The US interest rate will fluctuate
   d. All of the above

37. Which of the following is not possible when two securities are positively correlated:
   a. Asset A's mean return is negative while asset B's is positive
   b. Asset A's return is sometimes below its mean when asset B's is above its mean
   c. Asset A's mean return is negative while asset B's mean return is also negative
   d. All are possible

38. Suppose the return on stock ABC was 14%. If CAPM is correct and if $R_f$=3%, $R_m$=10% and ABC's Beta=1.45, the stock was:
   a. Overpriced (too high)
   b. Underpriced (too low)
   c. Properly priced
   d. Not enough information to answer

39. According to CAPM, if the expected return on asset 1, $E(r_1)$, is greater than the expected return on asset 2, $E(r_2)$, then:
   a. $r_1$ must always be greater than $r_2$
   b. $\sigma_1$ must be greater than $\sigma_2$
   c. $\beta_1$ must be greater than $\beta_2$
   d. all of the above must be true

40. Assume the variance of IBM is .16 and the variance of Microsoft is .25. If the variance of an equally weighted portfolio of these stocks is .0525, then the covariance between these stock is:
   (a) .10          (b) .20          (c) .25          (d) -.10

41. The following price data is available for SQV stock

| Date | 12/31/93 | 6/30/94 | 12/31/94 |
|------|----------|---------|----------|
| SQV | 75 | 95 | 90 |

At the end of 1993, using $100,000 of your own money, you buy $150,000 worth of SQV stock on margin at $75 per share. The call money rate (which is the rate that your broker charges you on any borrowed funds) was 8% per annum Effective Annual Rate. SQV did not pay any dividends in 1994. Ignore commissions. What is the value of your net worth at the end of 1994 (i.e., on 12/31/94)?

      a. $180,000
      b. $176,000
      c. $130,000
      d. $126,000

42. John and Jim are both risk averse and only care about the mean and standard deviation of their portfolio's return. They agree on the opportunity set available. There are N risky assets and a riskless asset. According to the CAPM, which of the following statements is correct?

      a. John and Jim hold the same portfolio of *all* assets.
      b. John and Jim may hold completely different portfolios of *risky* assets.
      c. When choosing between 2 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.

43. Suppose that among the many stocks in the market there are two securities, A and B, with the following characteristics: A has $\overline{X} = .08$ and $\sigma = .4$ and B has $\overline{X} = .13$ and $\sigma = .6$. If the correlation between these two is $\rho = -1$ and if it is possible to borrow and lend at the risk-free rate, $r_f$, then the *equilibrium* risk-free rate must be:

      (a) 9%      (b) 10%      (c) 11%      (d) any of the above

44. Which of the following best explains a decline in a dealer's inventory:

      a. bid price and offer price are too high
      b. bid price is too high and offer price is too low
      c. bid price is too low and offer price is too high
      d. bid price and offer price are too low

45. If "round trip" (buy plus sell) transactions costs (including the cost of borrowing securities) totaled $1.00 per $100 face value of a zero coupon bond, which of the following prices (per $100 face value) for CATs (C) and TIGRS (T) would be impossible in equilibrium because of arbitrage (more than one may be correct):

      a. C=92, T=97
      b. C=95, T=90
      c. C=96, T=95
      d. C=89, T=88
      e. none of the above

46. Circle the first two steps in a profitable arbitrage, given the following:

      Yield on U.K. government one-year note: 8%
      Yield on U.S. government one-year note: 5%
      Exchange rate (spot): 1.60 USD/Pound
      Exchange rate (one year forward): 1.70 USD/Pound

      a. Sell short US securities

b. Sell USD in spot foreign exchange market for pounds
c. Sell short UK securities
d. Sell pounds in spot foreign exchange market for USD
e. There is no arbitrage

47. In Japan, interest rates occasionally fluctuate below zero.  If interest rates stabilized for  two-years at -1% per annum, how would a two-year zero's price change after one year?
    a. Increase
    b. Decrease
    c. Stay same
    d. Cannot tell from information given

48. According to CAPM, an asset with a beta below one is riskier than the market portfolio when that risky security is held by itself.
    a. True
    b. False
    c. Cannot tell

49. According to CAPM, risk-neutral investors are more likely to invest in:
    a. The least risky portfolio on the efficient frontier of risky securities.
    b. The riskiest portfolio on the efficient frontier of risky securities.
    c. The market portfolio.
    d. Only the risk-free asset
    e. The market portfolio leveraged by the risk-free asset.

50. A portfolio of nondividend-paying stocks earned a geometric mean return of 6 percent per annum between January 1, 1997 and December 31, 2005. The portfolio earned an arithmetic mean return per annum of 7 percent over the same period. If the portfolio's value on January 1, 1997 was $100,000, the value on December 31, 2005 must have been $_____.

**SAMPLE MID-TERM ANSWERS**

    1.  D
    2.  C
    3.  A
    4.  B
    5.  B

6. B
7. C
8. A
9. C
10. C
11. B
12. D
13. C
14. B
15. A
16. D
17. B (7.73%)
18. D
19. D
20. A
21. D
22. A
23. C
24. D
25. C
26. C
27. C
28. A
29. C
30. A
31. E
32. D
33. D
34. 1a,2a,3b,4b
35. B
36. A
37. D
38. B
39. C
40. D
41. D
42. D
43. B
44. D
45. A and B
46. A and B
47. B
48. C
49. E
50. 168,947.90