Old Exam Questions
Portfolios

1. Under a mean-variance framework, your risk aversion determines your particular tangency portfolio.
   A. True
   B. False

2. How do we determine the optimal portfolio in a mean variance framework?
   A. Highest return
   B. Highest Jensen's alpha
   C. Highest Sharpe ratio
   D. Highest Treynor measure
   E. Lowest standard deviation

3. What is the correlation of the risk free asset with the market portfolio?
   A. 0
   B. 1
   C. A different value

4. You hold a portfolio of three stocks. 50% of your portfolio is in ABCo stock, which you expect to return 8% this year. 30% of your holdings are in B&O Operations, which is expected to yield 10% this year. The remainder of your portfolio is invested in MNO Industries, which you expect to have a return of 15%. What would you expect the return on your portfolio to be?
   A. 10%
   B. 11%
   C. 12%
   D. 13%
   E. 14%

5. Which of these is ***NOT*** one of the steps in the portfolio choice process outlined by the Two Fund Separation principle?
   A. Accuracy calibration
   B. Allocation between the optimal portfolio and the risk free asset
   C. Identification of the optimal portfolio
   D. All of these are steps in the process

6. Which of the following is the line formed by the risk free rate and the market portfolio when performing a mean-variance optimization?
   A. Capital Allocation Line
   B. Capital Market Line
   C. Security Characteristic Line
   D. Security Market Line
   E. No name given: it's just a line

7. Your portfolio is evenly split between two stocks: Qwerty Co., whose shares have a variance of 400, and Somesuch Industries, whose shares have a variance of 800. If the covariance of the two stocks is 200, what is the standard deviation of your portfolio?
   A. 3%
   B. 4%
   C. 17.32%
   D. 20%
   E. 22.36%
   F. A different value

8. You own shares in three companies. 20% of your portfolio is in Jacket, Inc., which you predict will earn a 10% return next period. The remainder is split equally between Spartan Industries and BulldogCo. You expect a 15% return on Spartan and a 20% return on Bulldog. What would you predict the return on your portfolio to be next period?
   A. 12%
   B. 14%
   C. 16%
   D. 19.5%
   E. A different value

9. What is the line formed by the market portfolio and T-bills when optimizing a portfolio under a mean-variance framework?
    A. Capital allocation line
    B. Capital market line
    C. Security characteristic line
    D. Security market line

10. You have a portfolio made up of two stocks. If the two stocks are perfectly positively correlated, the standard deviation of your portfolio would be _____.
    A. Equal to the weighted average of their standard deviations
    B. Greater than the weighted average of their standard deviations
    C. Less than the weighted average of their standard deviations
    D. No measurable relationship to the stocks' standard deviations

11. Any portfolio will earn a return _____ the weighted average of the constituent assets' returns.
    A. Equal to
    B. Greater than
    C. Less than
    D. The return has no relation to the individual assets' returns

12. According to Two Fund Separation, each individual investor will have a different _____.
    A. Allocation between risk-free asset and tangency portfolio
    B. Information set
    C. Optimal Portfolio
    D. Optimization technique

13. You are attempting to analyze your portfolio. 60% of your portfolio is invested in GreenCo., which has a standard deviation of 50%. The remaining 40% is invested in Big Brownies, whose standard deviation is 10%. You know that the covariance between these two companies is 100. What is the standard deviation of your portfolio? (HINT: Round intermediate calculations to 4 decimal places.)
   A. 22.25%
   B. 27%
   C. 31.05%
   D. 51.96%
   E. A different value

14. The set of risky portfolios with the lowest risk for a given level of return is known as the
   _____.
   A. Capital allocation line
   B. Efficient frontier
   C. Market portfolio
   D. Minimum variance frontier
   E. T-bill

15. You are analyzing your portfolio. You have 75% of your portfolio invested in Yellow Jacket, Inc., and the remaining 25% is invested in Tigers 'R' Us. You predict the following outcomes for these stocks next period:

State	Probability	Yellow Jacket, Inc.	Tigers 'R' Us
Boom	.5	-3%	6%
Bust	.5	17%	6%

What is the standard deviation of your portfolio?
   A. 2.5%
   B. 5%
   C. 7.5%
   D. 10%
   E. A different value

16. A portfolio of two stocks will have a return that is _____ the weighted average of the two stocks' returns.
   A. Equal to
   B. Greater than
   C. Less than
   D. There is no relationship between the two

17. In the Two Fund Separation model we mentioned, the second step involves which of the following?
    A. Allocating in your tangency portfolio and risk free asset based on your risk preferences
    B. Choosing what stocks to include in your portfolio
    C. Google
    D. Selecting a tangency portfolio based on your risk preferences
    E. There is no second step

18. You have two stocks in your portfolio. You have 60% of your portfolio invested in Volunteer Industries. The firm has earned returns of 10%, 19%, and 16% over the last 3 years. The remainder of your portfolio is invested in GameCo, which has generated returns of 7%, 20%, and 3% over the same time period. What is the average return of your portfolio over this time?
    A. 10%
    B. 11%
    C. 13%
    D. 15%
    E. A different value

19. Your portfolio is equally weighted in two stocks. You know that the variance of BlueTube is 1600, but you're unsure about Anamoz. You know, however, that the correlation of BlueTube and Anamoz is -0.25, and their covariance is -100. Given this information, what is the standard deviation of your portfolio? (HINT: Choose a given answer if your answer is within 0.1% of that choice.)
    A. 3.75%
    B. 10%
    C. 16.42%
    D. 19.36%
    E. A different value

20. You need to calculate the covariance of two stocks. The potential returns of these stocks are presented in the following table:

State	Probability	DieHard Batteries	McClain Solutions
Boom	.5	16%	18%
Normal	.25	4%	12%
Bust	??	12%	0%

What is the covariance of DieHard Batteries and McClain Solutions?
   A. 12
   B. 24
   C. 36
   D. 48
   E. A different value

21. You collected data on two stocks. You found that Sprayers Unlimited had returns the past three years of 5%, 15%, and -5% in years 1, 2, and 3, respectively. Meanwhile, Box World had returns of 16% in year 1, -4% in year 2, and 6% in year 3. What is the covariance of the two firms?
   A. -50
   B. 0
   C. 50
   D. 100
   E. A different value

22. How many covariance terms would you need to calculate in order to find the variance of a 5 stock portfolio using the formula?
   A. 5
   B. 6
   C. 10
   D. 16
   E. A different value

23. You own a portfolio consisting of two stocks, ABC Corp and B&O Holdings. You would like to calculate the correlation of the two stocks. You know that your portfolio's variance was 100. Your portfolio is equally weighted between the two, and the standard deviation of ABC was 20% while the standard deviation of B&O was 10%. What is the correlation of the two stocks?
   A. -0.25
   B. 0
   C. 0.25
   D. 0.75
   E. A different value

24. The standard deviation of a portfolio consisting of two stocks that are perfectly positively correlated is _____ the weighted average of the two stocks' standard deviations.
   A. Equal to
   B. Greater than
   C. Less than
   D. There is no relationship between the two

25. You were working on a group homework assignment in which you needed to calculate the standard deviation of a portfolio. Viggo was supposed to do it, but he quit part-way through (hate that guy...). You find that he had set up the following equation:

$$\sigma_p^2 = (.4 \quad .6)\begin{pmatrix} 25 & -1458 \\ -1458 & 3333 \end{pmatrix}\begin{pmatrix} .4 \\ .6 \end{pmatrix}$$

Assuming that his work is correct, what is the standard deviation of the portfolio?
(HINT: Round any intermediate calculations to 4 decimal places.)
   A. 27%
   B. 30%
   C. 33%
   D. 36%
   E. A different value

26. You have gathered the following data on the returns for Mike6 Industries and Smokey Loss Prevention Solutions over the last 3 years:

Company	2013	2014	2015
Mike6	20%	-10%	20%
Smokey	0%	10%	20%

What is the covariance of the two stocks over this period?
   A. -300
   B. 0
   C. 100
   D. 300
   E. A different value

27. You have invested a total of $100,000. You have invested $20,000 in TexCo, which you expect to earn a 10% return this year. You have also invested $30,000 in Buckeye Pollsters, which you believe will earn a 15% return this year. Another $25,000 is invested in Bammer Demolitions, which should earn a 16% return this year. The remainder of your portfolio is invested in ClemSolar, which you believe will earn a 12% return. What is the expected return on your portfolio?
   A. 12.75%
   B. 13%
   C. 13.25%
   D. 13.5%
   E. A different value

28. You want to calculate the standard deviation of a portfolio that is equally weighted in two stocks: Wildcat Solutions and Gator Asset Forfeiture. You know that Wildcat has a standard deviation of 30%, while Gator has a variance of 400. You know that the correlation between the two stocks is equal to 1. What is the standard deviation of this portfolio? *(HINT: Round any intermediate calculations to 4 decimal places)*
   A. 23%
   B. 25%
   C. 72.31%
   D. 72.97%
   E. A different value

29. You performed a portfolio optimization, and found that the optimal portfolio had an expected return of 16%, versus a standard deviation of 20%. The T-bill rate over the same time period was 1%. You chose to invest 80% of your personal portfolio in this optimal portfolio, leaving the remaining 20% in T-bills. What is the Sharpe ratio of your portfolio?
    A. 0.6
    B. 0.75
    C. 0.8
    D. 1
    E. A different value

30. What does a covariance of +1 tell us about the relationship between the return of two securities? Choose the best answer.
    A. They move in opposite directions
    B. They move in the same direction
    C. They move perfectly in opposite directions
    D. They move perfectly in the same direction

31. You are considering investing in two stocks. Macrosoft has a standard deviation of 30%, while Kumquat Devices has a standard deviation of 40%. If they have a covariance of -300, what is the correlation of these two companies?
    A. -0.25
    B. -0.1
    C. 0
    D. 0.25
    E. A different value

32. You are creating a portfolio. The portfolio is equally weighted between Lil Miss Snacks and Arkana Toys. Lil Miss has a historical standard deviation of 20%, while Arkana has a standard deviation of 40%. The covariance between the two securities is 250. What is the standard deviation of your portfolio?
    A. 6.25%
    B. 25%
    C. 27%
    D. 30%
    E. A different value

33. You have $100,000 to invest. You plan to form a portfolio consisting of $30,000 in Marlev Technologies, $40,000 in CD Literature, and the remainder in Light Mule Entertainment. If Marlev has a 12% return, CD has a 16% return, and Light Mule has an 8% return, what would be the return on your portfolio?
    A. 10.8%
    B. 11.3%
    C. 12%
    D. 12.4%
    E. A different value

34. Hoth Refrigerants earned an 8% return and a 16% return, in the past two years respectively. Meanwhile, Mustaf Infrastructure reported a 12% return followed by a 10% return. What was the covariance of the two stocks over that period?
    A. -8
    B. -4
    C. 0
    D. 16
    E. A different value

35. You were trying to calculate the beta of Mary Yoda Industries. You were able to find that the correlation of Mary Yoda with the S&P 500 is -0.2. You were also able to estimate that the variance of Mary Yoda was 0.09, while the variance of the S&P 500 was 0.04. What is the covariance of Mary Yoda with the S&P 500?
    A. -225
    B. -170
    C. -120
    D. -7
    E. A different value

Use the following information for questions 36-38:

You were attempting to use your shiny new graphing calculator to calculate the standard deviation of a portfolio. Unfortunately, the stupid thing is set to only give you the "exact" answer, so it just spits the matrix expression back out to avoid any rounding. So, you see the following:

$$\sigma_p^2 = (.4 \quad 0 \quad .6) \begin{pmatrix} 200 & 300 & -100 \\ 300 & 300 & 100 \\ -100 & 100 & 400 \end{pmatrix} \begin{pmatrix} .4 \\ 0 \\ .6 \end{pmatrix}$$

36. [Conceptual] How many stocks are you holding in your portfolio?
    A. 1
    B. 2
    C. 3
    D. 4
    E. A different value

37. [Conceptual] What is the covariance of the first and third stocks?
    A. -100
    B. 100
    C. 200
    D. 400
    E. A different value

38. [Quantitative] What is the variance of the portfolio?
    A. 1.28%
    B. 10.76%
    C. 11.31%
    D. 12.02%
    E. A different value

Use the following information for questions 39 and 40:

You and a friend recently came into some money. You decided to do the responsible thing and invest it. The two of you visit a local investment advisor, who tells you that he invests based on a two-fund separation model. Based on your low risk aversion and his calculations, he recommends that you invest 20% in T-bills, along with 40% in an S&P 500 index and 40% in a developing market fund. Afterward, you compare notes with your friend. You know that they are much more risk-averse than you, and so you see that the advisor recommended that they invest 50% in T-bills, along with 10% in an S&P 500 index and 40% in the developing market fund.

39. [Conceptual] What did the advisor do wrong?
    A. All investors should have the same portfolio
    B. The optimal portfolio is the same for all investors
    C. They made up the idea of two fund separation
    D. They did nothing wrong

40. [Conceptual] Since you know your friend tends not to pay attention very well, you figure that your allocation was correct and theirs was incorrect. Which of the following is most likely to be an appropriate allocation for them based on our class discussion?
    A. 0% in T-bills, 50% in an S&P 500 index, and 50% in a developing market fund
    B. 20% in T-bills, 40% in an S&P 500 index, and 40% in a developing market fund
    C. 50% in T-bills, 10% in an S&P 500 index, and 40% in a developing market fund
    D. 50% in T-bills, 25% in an S&P 500 index, and 25% in a developing market fund
    E. None of these would make sense

41. [Quantitative] You were in the middle of calculating the portfolio standard deviation when Excel froze. You know that the variance of the portfolio was:

$$\sigma_p^2 = (.4 \quad .6)\begin{pmatrix} 900 & -1200 \\ -1200 & 1600 \end{pmatrix}\begin{pmatrix} .4 \\ .6 \end{pmatrix}$$

What is the standard deviation of this portfolio?
    A. 19.12%
    B. 19.67%
    C. 20.14%
    D. 20.78%
    E. A different value

42. [Quantitative] You have gathered data on two stocks over the course of three months. Their returns over that time are:

Month	Rogue Holdings	OneCo.
1	5%	-10%
2	10%	20%
3	0%	5%

What is the covariance of these two securities?
   A. 0
   B. 37.5
   C. 75
   D. 100
   E. A different value

43. [Quantitative] FishyGold Cracker Industries typically earns a 12% return, and its standard deviation is 33%. If the current T-bill rate is 1%, what is the Sharpe ratio of this security?
   A. 0.3333
   B. 0.5
   C. 0.6667
   D. 3
   E. A different value

44. [Quantitative] You have constructed a portfolio consisting of 20% in Auble Construction, 40% in Bammer Records, and 40% in Jacket Waste Disposal. If you expect the return on Auble to be 12%, the return on Bammer to be 17%, and the return on Jacket to be 2%, what is the expected return of your portfolio?
   A. 9.2%
   B. 9.6%
   C. 10%
   D. 10.4%
   E. A different value

45. [Quantitative] You were in the middle of evaluating the risk of your portfolio in Excel, but you forgot how to input the formulas. You have the following equation:

$$\sigma_p^2 = (.2 \quad .8)\begin{pmatrix} 900 & 360 \\ 360 & 625 \end{pmatrix}\begin{pmatrix} .2 \\ .8 \end{pmatrix}$$

Given this, what is the standard deviation of your portfolio?
   A. 22.73%
   B. 23.48%
   C. 24.17%
   D. 25%
   E. A different value

46. [Conceptual] You optimized your portfolio and found that the optimal portfolio was 20% in SEC Holdings and 80% in Dawg Construction. You choose to invest in exactly that portfolio. You see that your friend's portfolio consists of 50% in T-bills, with 10% in SEC Holdings and 40% in Dawg Construction. Assuming that you performed your optimization correctly, are these portfolio choices consistent with the idea of two fund separation?
   A. Both are consistent
   B. Mine is; My friend's is not
   C. Mine is not; My friend's is
   D. Neither is consistent

47. [Conceptual] Suppose you have a portfolio of two stocks. The correlation on these stocks is equal to -1. Which of the following **_MUST_** be true regarding the standard deviation of this portfolio?
   A. Equal to the weighted average of the individual standard deviations
   B. Greater than the weighted average of the individual standard deviations
   C. Less than the weighted average of the individual standard deviations
   D. Equal to 0
   E. None of these

48. [Quantitative] You won the lottery! You quit your job and plan to live on your $10 million winnings. You figure that you will need to withdraw $100,000 per year to live on. You are considering an investment plan that you expect to earn 11% per year, with a standard deviation of 25%. If the T-bill rate next year is expected to be 0.5%, what is the safety first ratio of this investment?
   A. 0.4
   B. 0.42
   C. 0.44
   D. 0.46
   E. A different value

49. [Conceptual] The set of all risky portfolios with the lowest risk for their return and the highest return for their risk lies along the _____.
   A. Capital allocation line
   B. Capital market line
   C. Efficient frontier
   D. Minimum variance frontier
   E. A different line

50. [Conceptual] Suppose you are given the following covariance matrix:

$$\begin{pmatrix} 0.09 & -0.01 & 0.01 & -0.02 \\ -0.01 & 0.04 & 0.02 & 0 \\ 0.01 & 0.02 & 0.16 & -0.03 \\ -0.02 & 0 & -0.03 & 0.25 \end{pmatrix}$$

Which of the following is negative?
   A. The covariance of the first stock with the fourth stock
   B. The covariance of the first stock with the third stock
   C. The covariance of the second stock with the third stock
   D. The covariance of the second stock with the fourth stock
   E. The variance of the third stock

51. [Conceptual] You are managing the endowment for a small non-profit you founded. The portfolio is valued at $1,000,000. You expect that you'll need to withdraw $50,000 in order to meet obligations this year, so you'd like to ensure that you'll earn at least that much by optimizing with respect to the safety first ratio. You've used Solver to maximize the safety first ratio and found a portfolio with a return of 14% and a standard deviation of 24%. You also know that the T-bill rate is 6%. What is the chance of a shortfall using your safety first optimal portfolio?
    - A. 0%
    - B. $1 - N(0.375)$
    - C. $N(0.375)$
    - D. 100%
    - E. A different value

52. [Quantitative] You expect a 13% return and a variance of 400 on your portfolio. At the same time, you figure the T-bill rate will be 1%. What is the Sharpe ratio of your portfolio?
    - A. 0.03
    - B. 0.04
    - C. 0.6
    - D. 0.65
    - E. A different value

53. [Quantitative] You are interested in adding two companies to your portfolio. You have observed to two over the last 3 years. During that time, Kirby Industries generated returns of 14%, 1%, and 12%, respectively. Jackson Financial's returns were 8%, 6%, and -5% over the same time period. What is the covariance of these stocks over the past 3 years?
    - A. -11.5
    - B. -8.33
    - C. -6.67
    - D. 23.47
    - E. A different value

54. [Quantitative] You have $100,000 saved for retirement, which you've invested in 3 securities. You have $30,000 in Frame Sales, which you expect to earn 12%. You also have $40,000 in Boxes 'R' Us, which you predict will generate an 8% return. The remainder of your funds are invested in PaintCo, which has a 16% expected return. What is the expected return on your portfolio?
  A. 11.4%
  B. 11.6%
  C. 11.8%
  D. 12%
  E. A different value

55. [Quantitative] You plan to create a portfolio using two stocks, Ruh News and Roh Entertainment. You know that Ruh has a variance of 10, while Roh has a variance of 12. Further, you have calculated that the covariance beteween the two is equal to -2. If you plan to invest 40% in Ruh and 60% in Roh, what is your portfolio's standard deviation?
  A. 2.11%
  B. 2.23%
  C. 2.36%
  D. 2.45%
  E. A different value

56. [Quantitative] Your portfolio consists of 3 stocks. You have observed the following returns for these companies over the past few years:

Year	Dach Co.	Shund Corp	Hotdogs 'R' Us
1	6%	-1%	14%
2	9%	15%	-2%
3	12%	13%	6%

If your portfolio is equally weighted among the 3 stocks, what is the return on your portfolio?
  A. 6%
  B. 7%
  C. 8%
  D. 9%
  E. A different value

57. [Quantitative] You are considering two stocks for a portfolio. You believe that their returns are dependent on the state of the economy, and these projections are presented in the following table:

Economy	Probability	Half Full, Inc.	Half Empty Co.
Good	50%	20%	-10%
Bad	50%	0%	10%

Given this, what is the correlation of these securities?
   A. -1
   B. -0.5
   C. 0.5
   D. 1
   E. A different value

58. [Quantitative] You are considering a portfolio that is equally weighted between two stocks. Wimpy Bags has a standard deviation of 20%, while Cena Solutions has a standard deviation of 10%. You estimate that the correlation between the two is -0.5. What is the standard deviation of this portfolio?
   A. 8.5%
   B. 8.66%
   C. 8.83%
   D. 9%
   E. A different value

59. [Quantitative] You are attempting to calculate the covariance of two stocks, Kro Grocers and Zon Sales. You believe that the returns of the two stocks next year are dependent on the state of the economy. You believe that there will either be a good, normal, or bad economy next year, with each being equally likely. In a boom economy, the return on Kro will be 5%, while the return on Zon will be 12%. In a normal economy, the return on Kro will be 10%, while the return on Zon will be 12%. In a bust economy, the return on Kro will be 15%, while the return on Zon will be 12%. Given this information, what is the covariance of Kro and Zon?
   A. -0.5
   B. -0.25
   C. 0
   D. 0.25
   E. A different value

60. [Conceptual] You are given that two stocks have a covariance of 1. Based on this information, what can you say about the relationship between the two?
    A. Their movements are unrelated
    B. They tend to move in opposite directions
    C. They tend to move in the same direction
    D. They tend to move strongly in opposite directions
    E. They tend to move strongly in the same direction