Sample Problems—Risk and rates of return

1. An investor is forming a portfolio by investing $50,000 in stock A which has a beta of 1.50, and $25,000 in stock B which has a beta of 0.90. The return on the market is equal to 6 percent and Treasury bonds have a yield of 4 percent. What is the required rate of return on the investor's portfolio?

2. Given the following probability distribution, what is the expected return and the standard deviation of returns for Security J?

State	P_j	r_j
1	0.2	10%
2	0.6	15%
3	0.2	20%

3. You hold four stocks in your portfolio—Stock A, Stock B, Stock C, and Stock D. Your portfolio beta is 1.2. Stock C constitutes 40 percent of the dollar value of your holdings and has a beta of 0.60. If you sell all of your holdings in Stock C, and replace them with an equal investment in Stock E (which has a beta of 0.95), your new portfolio beta will be _____.

4. If $R_f = 7\%$, $R_M = 12\%$, and $r_j = 15\%$, what is the stock's beta?

5. You are given the following distribution of dollar returns:

Probability	Return
40%	$30
50%	$25
10%	-$25

   What is the standard deviation of the expected dollar returns?

6. If the risk-free rate is 7 percent, the expected return on the market is 10 percent, and the expected return on Security J is 13 percent, what is the beta of Security J?

7. You hold a diversified portfolio consisting of a $10,000 investment in each of 20 different common stocks (i.e., our total investment is $200,000). The portfolio beta is equal to 1.2. You have decided to sell one of your stocks, which has a beta equal to 0.7 for $10,000. You plan to use the proceeds to purchase another stock which has a beta equal to 1.4. What will be the beta of the new portfolio?

8. Given the following probability distribution, what are the expected return and the standard deviation of returns for Security J?

State	P_i	r_j
1	0.2	10%
2	0.6	15%
3	0.2	20%

9. The table below gives the portfolio weights and the beta coefficients of three stocks that you will hold as your portfolio. If the risk free rate is 6% per year, and the return on the market portfolio is 18% per year, what the expected return on this portfolio?.

Stock	Portfolio Weight	Beta
A	0.50	1.8
B	0.20	0.40
C	0.30	1.20

10. The price of stock J is $40 per share, and that of stock K is $60 per share. Suppose you form a portfolio of these two stocks by buying 100 shares of stock J and 400 shares of stock K. In this portfolio, what would be the weight of stock K?

11. The table below gives the portfolio weights and the beta coefficients of three stocks that you will hold as your portfolio. If the risk free rate is 6% per year, and the return on the market portfolio is 18% per year, what is the expected return on this portfolio?

Stock	Portfolio weight	Beta coefficient
J	0.50	0.80
K	0.20	1.40
L	0.30	1.20

12. An analyst has provided information on possible returns for ABC Corporation stock. What is the standard deviation of expected returns for this stock, given the following distribution?

	Pr_i	r_i
Scenario 1	20%	-40%
Scenario 2	50%	0%
Scenario 3	30%	30%

13. You hold three stocks in your portfolio--stock A, stock B, and stock C. The portfolio beta is 1.50. Stock A makes up 20 percent of the dollar value of your holdings and has a beta of 1.00. If you sell all of your holdings in stock A, and replace them with an equal investment in stock D (which has a beta of 1.25), what will be the beta of your new portfolio?

14. You form a portfolio with 45% invested in stock X and the remainder in stock Y. The expected return for stock X is 14% and the expected return for stock Y is 22%. What is the expected return of the portfolio?

15. Asset A has an expected return of 15% and a beta of 0.95. The risk-free rate is 5 percent. What is the market risk premium?

16. Which of the following stocks

	Probability	Return for	
	(Pr_i)	Stock A	Stock B
Boom	30%	60%	50%
Good	40%	30%	30%
Recession	30%	5%	-5%

has the greatest expected return and by how much?

17. You are given the following probability distribution of returns:

Probability	Return
40%	$30
50%	$25
10%	-$20

What is the coefficient of variation of the expected dollar returns?

18. You hold a diversified portfolio consisting of a $20,000 investment in each of 10 different common stocks (i.e., our total investment is $200,000). The portfolio beta is equal to 1.2. You have decided to sell one of your stocks, which has a beta equal to 0.7 for $20,000. You plan to use the proceeds to purchase another stock that has a beta equal to 1.4. What will be the beta of the new portfolio?

19. Given the following probability distribution, what are the expected return and the standard deviation of returns for Security J?

State	P_i	r_i
1	0.2	10%
2	0.6	15%
3	0.2	20%

20. The table below gives the portfolio weights and the beta coefficients of three stocks that you will hold as your portfolio. If the risk free rate is 5% per year, and the return on the market portfolio is 12% per year, what the expected return on this portfolio?.

Stock	Portfolio Weight	Beta
A	0.50	1.20
B	0.20	0.40
C	0.30	1.80

21. If the risk-free rate is 4 percent, the expected return on the market is 6 percent, and the expected return on Metallica Bearings, Inc. is 8 percent, what is beta of Metallica?

22. You have a total of $30,000 invested in three stocks:

Stock	Investment	Stock's Beta Coefficient
A	$6,000	1.0
B	$15,000	1.25
C	$9,000	1.75

What is the beta of you portfolio?

23. The expected return for a portfolio that is 70% invested in A and 30% invested in B is **19.18%**. What is the standard deviation of returns for this portfolio?

	Probability	Return on A	Return on B
Boom	0.65	30%	5%
Bust	0.35	10%	20%
E(R)		23%	10.25%
σ		9.54%	7.15%