

Econ 20B- Additional Problem Set 5

I. MULTIPLE CHOICES. Choose the one alternative that best completes the statement to answer the question.

1. Which of the following is the correct way to figure the future value of \$X that earns r percent for N years?
 - a. $\$X(1 + rN)N$
 - b. $\$X(1 + r)N$
 - c. $\$X(1 + rN)$
 - d. $\$X(1 + r/N)N$

2. At an annual interest rate of 10 percent, about how many years will it take \$100 to triple in value?
 - a. 8
 - b. 10
 - c. 12
 - d. 14

3. Hector puts \$150 into an account when the interest rate is 4 percent. Later he checks his balance and finds he has about \$168.73. How long did Hector wait to check his balance?
 - a. 3 years
 - b. 3.5 years
 - c. 4 years
 - d. 4.5 years

4. Alex says that \$400 saved for one year at 4 percent interest has a smaller future value than \$400 saved for two years at 2 percent interest. Brian says that the present value of \$400 one year from today if the interest rate is 4 percent is more than the present value of \$400 two years from today if the interest rate is 2 percent.
 - a. Alex and Brian are both correct.
 - b. Alex and Brian are both incorrect.
 - c. Only Alex is correct.
 - d. Only Brian is correct.

5. Which of the following is the correct expression for finding the present value of a \$500 payment two years from today if the interest rate is 4 percent?
 - a. $\$500/(1.04)^2$

- b. $\$500 - 500(1.04)^2$
- c. $\$500 - \$500/ (.04)^2$
- d. None of the above is correct.

6. Which of the following changes would increase the present value of a future payment?

- a. a decrease in the size of the payment
- b. an increase in the time until the payment is made
- c. a decrease in the interest rate
- d. All of the above are correct.

7. You've been promised a payment of \$400 in the future. In which case is the present value of this payment highest?

- a. you wait 3 years and the interest rate is 6%
- b. you wait 3 years and the interest rate is 5%
- c. you wait 2 years and the interest rate is 6%
- d. you wait 2 years and the interest rate is 5%

8. You have a choice among three options. Option 1: receive \$900 immediately. Option 2: receive \$1,200 one year from now. Option 3: receive \$2,000 five years from now. The interest rate is 15% per year. Rank these three options from highest present value to lowest present value.

- a. Option 1; Option 2; Option 3
- b. Option 3; Option 2; Option 1
- c. Option 2; Option 3; Option 1
- d. Option 3; Option 1; Option 2

9. Robert is risk averse and has \$1,000 with which to make a financial investment. He has three options. Option A is a risk-free government bond that pays 5 percent interest each year for two years. Option B is a low-risk stock that analysts expect to be worth about \$1,102.50 in two years. Option C is a high-risk stock that is expected to be worth about \$1,200 in four years. Robert should choose

- a. option A.
- b. option B.
- c. option C.
- d. either A or B because they are the same to him.

10. If a person is risk averse, then she has

- a. diminishing marginal utility of wealth, implying that her utility function gets flatter as wealth increases.
- b. diminishing marginal utility of wealth, implying that her utility function gets steeper as wealth increases.
- c. increasing marginal utility of wealth, implying that her utility function gets flatter as wealth increases.
- d. increasing marginal utility of wealth, implying that her utility function gets steeper as wealth increases.

11. Which of the following games might a risk-averse person be willing to play?

- a. A game where she has a 60 percent chance of winning \$1 and a 40 percent chance of losing \$1.
- b. A game where she has a 70 percent chance of winning \$1 and a 30 percent chance of losing \$1.
- c. Both A and B.
- d. Neither A nor B.

12. Diminishing marginal utility of wealth implies that the utility function is

- a. upward sloping and has decreasing slope.
- b. upward sloping and has increasing slope.
- c. downward sloping and has decreasing slope.
- d. downward sloping and has increasing slope.

13. Annie knows that people in her family die young, and so she buys life insurance. Harry knows he is a reckless driver and so he applies for automobile insurance.

- a. These are both examples of adverse selection.
- b. These are both examples of moral hazard.
- c. The first example illustrates adverse selection, and the second illustrates moral hazard.
- d. The first example illustrates moral hazard, and the second illustrates adverse selection.

14. Other things the same, as the number of stocks in a portfolio rises,

- a. risk increases and so the standard deviation of the return rises.
- b. risk increases and so the standard deviation of the return falls.
- c. risk decreases and so the standard deviation of the return rises.
- d. risk decreases and so the standard deviation of the return falls.

15. A high ranking corporate official of a well-known company is unexpectedly sentenced to prison for criminal activity in trading stocks. This should

- a. raise the price and the present value of the corporation's stock.
- b. raise the price and lower the present value of the corporation's stock.
- c. lower the price and raise the present value of the corporation's stock.
- d. lower the price and the present value of the corporation's stock.

16. According to the efficient market hypothesis, which of the following is not correct?

- a. Stock market prices tend to rise today if they rose yesterday.
- b. As judged by the typical person in the market, all stocks are fairly valued all the time.
- c. At the market price, the number of shares being offered for sale matches the number of shares people want to buy.
- d. All of the above are incorrect.

II. CALCULATIONS AND EXPLANATIONS. Compute the numbers and provide explanations when necessary.

1. Suppose we are considering investing in a stock priced as \$ 55 per share today. We know that it will bring \$ 1 dividend every year and can be sold out as \$ 65 per share 5 years later. Assume the interest rate is constant at 5% every year. Calculate the present value of the stock, is this stock overvalued or undervalued? Show your work.

2. Suppose GM has a new project that would cost \$10 million today and yield a payoff of \$15 million in 4 years.

- a. should GM undertake the project if the interest rate is 11 percent? 10 percent? 9 percent? 8 percent?
- b. Can you figure out the exact cutoff for the interest rate between profitability and non-profitability of this project?

III. SHORT ESSAYS. Answer the following questions briefly but concisely.

1. Give two conditions that are important to the efficient market theory. List one implication of the efficient market theory.

2. List three different ways that a risk-averse person can reduce financial risk.