
Final Exam

You have until 10:00am to complete this exam. Be certain to put your name, id number and section on both the exam and your scantron sheet and fill in test form A on the scantron. Answer all multiple choice questions on your scantron sheet. Choose the single best answer for each question; if you fill in multiple answers for a question you will be marked wrong. Answer the long answer questions directly on the exam. You must show your work for full credit. Answers may be left as fractions. Please place a box around final answers when appropriate. Good luck!

Name:

ID Number:

Section:

SECTION I: MULTIPLE CHOICE (50 points)

1. A firm is currently producing at a level of output where the marginal cost of the last unit produced exceeded the marginal revenue of the last unit produced. This firm:
 - (a) May be maximizing profits and could be a competitive firm or a monopoly.
 - (b) May be maximizing profits but only if it is a monopolist.
 - (c) May be maximizing profits but only if it is a perfectly competitive firm.
 - (d) Is not maximizing profits.
2. If Adam's marginal utility from apples is positive and his marginal utility from oranges is negative, on a graph with apples on the horizontal axis and oranges on the vertical axis:
 - (a) Adam's indifference curves will have a positive slope.
 - (b) Adam's indifference curves will have a negative slope.
 - (c) Adam's indifference curves will be horizontal lines.
 - (d) Adam's indifference curves will be vertical lines.
3. Suppose that a firm uses capital and labor as its only two inputs. The firm's production technology exhibits a positive, diminishing marginal product of capital, a positive, diminishing marginal product of labor, and smooth convex isoquants. Currently the firm is minimizing costs by using 10 units of capital and 10 units of labor. If the price of labor increases relative to the price of capital, the firm will:
 - (a) Increase the amount of labor and increase the amount of capital they use if they want to continue producing the same amount and minimize costs.
 - (b) Increase the amount of labor and decrease the amount of capital they use if they want to continue producing the same amount and minimize costs.
 - (c) Decrease the amount of labor and increase the amount of capital they use if they want to continue producing the same amount and minimize costs.
 - (d) Decrease the amount of labor and decrease the amount of capital they use if they want to continue producing the same amount and minimize costs.

4. If the demand curve is downward sloping and the supply curve is upward sloping, increasing a quantity tax from \$1 to \$2 will definitely:
 - (a) Increase tax revenue.
 - (b) Decrease tax revenue.
 - (c) Increase deadweight loss.
 - (d) Decrease deadweight loss.
5. Suppose that the Engel curve for lobsters is upward sloping. We can say for certain that:
 - (a) Lobsters are a normal good.
 - (b) Lobsters are an ordinary good.
 - (c) Both (a) and (b).
 - (d) Neither (a) nor (b).
6. At a firm's current level of output, average costs exceed marginal costs. This means that the firm is:
 - (a) Earning positive profits.
 - (b) On a downward sloping portion of the average cost curve.
 - (c) On an upward sloping portion of the average cost curve.
 - (d) Not behaving optimally.
7. A firm with two factories is producing 10 units of output at one factory and 20 units of output at its other factory. Which of the following statements is definitely true if the firm is minimizing costs?
 - (a) The average costs at the two factories are currently equal.
 - (b) The factories have identical cost functions.
 - (c) The marginal costs at the two factories are currently equal.
 - (d) The fixed costs at the first factory are higher than the fixed costs at the second factory.
8. Suppose that a firm has constant average costs of \$4 per unit. Which of the following statements is definitely true:
 - (a) Fixed costs are zero.
 - (b) Marginal costs are increasing.
 - (c) Marginal costs are decreasing.
 - (d) Not enough information.
9. All firms in the paperclip industry have identical cost functions. The paperclip industry is perfectly competitive and there are currently 500 firms in the short run equilibrium. The number of paperclip firms in the long run will be:
 - (a) Greater than 500.
 - (b) Equal to 500.
 - (c) Less than 500.
 - (d) Not enough information.

10. A person who prefers averages to extremes will have:
 - (a) Linear indifference curves.
 - (b) Convex indifference curves.
 - (c) Concave indifference curves.
 - (d) Convex budget lines.
11. A perfectly competitive firm should shut down in the short run if:
 - (a) Profits would be negative if they stayed open.
 - (b) Producer surplus would be negative if they stayed open.
 - (c) Output would be below the efficient quantity if they produced.
 - (d) Output would be above the efficient quantity if they produced.
12. For a monopolist facing a downward-sloping, linear demand curve, marginal revenue is:
 - (a) Constant.
 - (b) Greater at the profit-maximizing level of output than the socially efficient level of output.
 - (c) Smaller at the profit-maximizing level of output than the socially efficient level of output.
 - (d) (a) or (b) could be true.
13. The price elasticity of demand for a good with no close substitutes will tend to:
 - (a) Be equal in magnitude to the price elasticity of demand for a good with many close substitutes.
 - (b) Be larger in magnitude than the price elasticity of demand for a good with many close substitutes.
 - (c) Be smaller in magnitude than the price elasticity of demand for a good with many close substitutes.
 - (d) Have the opposite sign of the price elasticity of demand for a good with many close substitutes.
14. Coffee and donuts are complements. When the price of coffee increases, the substitution effect for donuts:
 - (a) Will be larger in magnitude than the income effect for donuts.
 - (b) Will be smaller in magnitude than the income effect for donuts.
 - (c) Will be equal in magnitude than the income effect for donuts.
 - (d) Not enough information.
15. If a monopolist uses a two-part tariff:
 - (a) Consumer surplus will be maximized.
 - (b) Total surplus will be maximized.
 - (c) Output will be less than the efficient level.
 - (d) Output will be greater than the efficient level.
16. A firm is currently at a point on their isoquant where the isoquant is steeper than the isocost curve. If the firm moves up and left along its current isoquant:
 - (a) Output will stay the same and costs will decrease.
 - (b) Output will stay the same and costs will increase.
 - (c) Costs will stay the same and output will increase.
 - (d) Costs will stay the same and output will decrease.

17. A company that manufactures bikes uses a constant returns to scale technology and has no fixed costs. Suppose that the company decides to double the level of inputs it uses. Which of the following will definitely be true?
- (a) Costs and revenues will both double.
 - (b) Costs will double but revenues will less than double.
 - (c) Costs will double but revenues will more than double.
 - (d) Not enough information.
18. Which of the following would shift the budget line while leaving the slope unchanged?
- (a) Increasing income and holding prices constant.
 - (b) Holding income constant and doubling the prices of both goods.
 - (c) Both (a) and (b).
 - (d) Neither (a) nor (b).
19. Bob and Chris are the only two consumers for hamburgers and both have downward-sloping, linear demand curves. Bob never buys hamburgers when the price goes above \$5 and Chris never buys hamburgers when the price goes above \$10. The market demand curve:
- (a) Will have a kink at \$5 and will be flatter to the right of the kink than to the left of the kink.
 - (b) Will have a kink at \$5 and will be flatter to the left of the kink than to the right of the kink.
 - (c) Will have a kink at \$15 and will be flatter to the right of the kink than to the left of the kink.
 - (d) Will have a kink at \$15 and will be flatter to the left of the kink than to the right of the kink.
20. Suppose that a competitive firm is currently producing at a point where market price equals the firm's marginal cost and the marginal cost curve is downward sloping. The firm could increase profits by:
- (a) Increasing the quantity they produce.
 - (b) Decreasing the quantity they produce.
 - (c) Increasing the price they charge.
 - (d) None of the above.

SECTION II: SHORT ANSWER (50 points)

1. (12 points) A deli specializes in making grilled cheese sandwiches. Each sandwich requires two slices of bread and one slice of cheese. While the deli can make fractions of sandwiches, it must always follow this fixed proportion of bread to cheese. For example, the deli could make half a grilled cheese sandwich by using one slice of bread and half a slice of cheese.
 - (a) Write down the deli's production function for sandwiches as a function of the number of slices of bread (B) and the number of slices of cheese (C) used.
 - (b) Sketch the isoquants corresponding to 10 sandwiches and 20 sandwiches on a graph with B on the horizontal axis and C on the vertical axis.
 - (c) Derive an expression for costs as a function the number of sandwiches produced (S) assuming that the firm chooses its input levels to minimize total costs.

2. (12 points) The California State Fair is deciding how much to charge for their rides. The California State Fair is a monopolist (there are no other state fairs in California). The fair has no fixed costs and has to spend \$1 in electricity costs every time a person goes on a ride. Assume there are no other costs for the fair. Demand for rides when the price of a ride is p is given by:

$$D(p) = 100 - \frac{1}{5}p \quad (1)$$

- (a) Suppose that the fair decides to make admission to the fair free and charge people per ride. Assume that the fair must charge everyone the same price per ride no matter who the person is or how many rides they go on. What price will the fair charge per ride, how many rides will people take and what will the fair's profits be?
- (b) What is the socially efficient quantity of rides? What is the deadweight loss generated by the fair acting as a monopolist?
- (c) Suppose that the fair decides to have an admission fee in addition to a price per ride. What admission fee will the fair charge and what price will they charge per ride? What are the fair's profits now? (To simplify things, you can think of the demand as coming entirely from a single consumer.)

3. (16 points) There are 50 identical firms in the car rental industry. Each firm has the following total cost function:

$$C(R) = 10 + 5R + 25R^2 \quad (2)$$

where R is the number of cars they rent. Demand for car rentals when the price of a rental is p is given by:

$$D(p) = 495 - 9p \quad (3)$$

- (a) Derive expressions for an individual firm's average cost, average variable cost and marginal cost functions.
- (b) What is the shutdown price for the firms?
- (c) Derive an expression for the industry supply curve.
- (d) What is the short-run equilibrium price and quantity?

4. (10 points) The graph below shows the current short run equilibrium in the market for cars. The market is perfectly competitive and all firms are currently earning zero profits. Suppose that we introduce a \$5 quantity tax on consumers. Show the following effects of this quantity tax on the graph (note that you will be able to give exact numbers for some but not all of the quantities below):
- Any relevant shifts in the supply and demand curves in the short run and long run.
 - The new price paid by consumers and the new price received by producers in the short run.
 - The new number of cars sold in the short run.
 - The new price paid by consumers and the new price received by producers in the long run.
 - The new number of cars sold in the long run.

