Ecn 100 - Intermediate Microeconomic Theory
University of California - Davis December 10, 2009
Instructor: John Parman

Final Exam

You have until 12:30pm 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 (60 points)

1. A monopolist with constant marginal costs in an industry with a downward sloping demand curve will:
   (a) Produce more if the firm can only charge a single price per unit than if it can use first-degree price discrimination.
   (b) Produce less if the firm can only charge a single price per unit than if it can use first-degree price discrimination.
   (c) Produce the same quantity whether it charges a single price per unit or uses first-degree price discrimination.
   (d) Produce more than the efficient quantity if it can use first-degree price discrimination.

2. Suppose that a firm has two factories, A and B. The cost of producing y at factory A is $4y^2$. The cost of producing y at factory B is $2y^2$. To minimize costs, the firm will:
   (a) Split output evenly between the two factories.
   (b) Use both factories but produce more at factory A than at factory B.
   (c) Use both factories but produce more at factory B than at factory A.
   (d) None of the above.

3. Suppose that instead of the cost functions given in Question 2, the cost of producing y at factory A is $4y$ and the cost of producing y at factory B is $2y$. Given these costs, the firm will minimize total costs by:
   (a) Splitting output evenly between the two factories.
   (b) Using both factories but producing more at factory A than at factory B.
   (c) Using both factories but producing more at factory B than at factory A.
   (d) None of the above.

4. Which of the following statements is true about industry supply in a perfectly competitive industry:
   (a) The long run supply curve will be upward sloping.
   (b) The long run supply curve will be downward sloping.
   (c) The long run supply curve will be a vertical line.
   (d) The long run supply curve will be a horizontal line.
5. If coffee and tea are perfect substitutes, which of the following can we say for certain?
   (a) A consumer will buy only coffee if the price of coffee is less than the price of tea.
   (b) A consumer will buy positive quantities of both coffee and tea.
   (c) A consumer will spend all of her money on tea if the ratio of marginal utility to price is greater for tea than for coffee.
   (d) Both (a) and (c).
6. Suppose that a monopolist has constant, positive marginal costs and faces a downward sloping demand curve. If the monopolist is currently producing at its profit-maximizing quantity:
   (a) Revenue will decrease if the monopolist increases its quantity.
   (b) Marginal revenue will decrease if the monopolist increases its quantity.
   (c) Costs will decrease if the monopolist increases its quantity.
   (d) Marginal costs will decrease if the monopolist increases its quantity.
7. If a competitive firm faces a market price that is in between the minimum of the firm's average cost curve and the minimum of the firm's average variable cost curve, the firm:
   (a) Should shut down.
   (b) Will have positive profits but negative producer surplus.
   (c) Will have negative profits but positive producer surplus.
   (d) Will have negative profits and negative producer surplus.
   (e) Will have positive profits and positive producer surplus.
8. Suppose consumers have downward sloping demand curves and firms have upward sloping marginal cost curves. In a competitive industry, a tax placed on consumers producers will:
   (a) Increase the price received by producers in the short run but have no effect on the long run price received by producers.
   (b) Decrease the price received by producers in the short run but have no effect on the long run price received by producers.
   (c) Increase the price received by producers in the short run and in the long run.
   (d) Decrease the price received by producers in the short run and in the long run.
9. Suppose that magazines and coffee are complements. If the price of magazines increases:
   (a) The sign of the substitution and income effects for coffee will both be positive.
   (b) The sign of the substitution and income effects for coffee will both be negative.
   (c) The substitution effect will be positive and the income effect will be negative for coffee.
   (d) The substitution effect will be negative and the income effect will be positive for coffee.

10. If preferences are strictly convex and bundle A and bundle B give a consumer the same level of utility, then:
    (a) The consumer would prefer an average of the two bundles to either one of the individual bundles.
    (b) The consumer would have concave indifference curves.
    (c) The consumer would have an increasing marginal rate of substitution.
    (d) The consumer's indifference curves would have the same slope at bundle A and bundle B.
11. Which of the following is definitely true at the efficient quantity?
    (a) Consumer surplus is at its maximum.
    (b) Producer surplus is at its maximum.
    (c) Profits are zero.
    (d) Total surplus is at its maximum.
12. A competitive firm's cost function is given by $C(y) = 10y^2 - 10$. Which of the following is not true?
    (a) The difference between profits and producer surplus is $10.
    (b) The firm will produce at all positive prices.
    (c) The firm will earn profits at all positive prices.
    (d) The firm has increasing marginal costs.
13. Suppose that capital is fixed in the short run but labor is a variable input. Capital and labor are the only inputs used in production. Which of the following would definitely not affect the short run level of production if it changed?
    (a) The price of output.
    (b) The wage.
    (c) The fixed level of capital.
    (d) The price of capital.
14. There are only two consumers in the market for hamburgers. The two consumers have identical, linear demand curves. The market demand curve will be:
    (a) Linear and twice as steep as the individual demand curve.
    (b) Linear and half as steep as the individual demand curve.
    (c) Linear and exactly as steep as the individual demand cure.
    (d) Kinked at some point in the middle of the demand curve.
15. Suppose that demand for Coke is more elastic than demand for Pepsi and that consumers are currently buying the same amount of Coke and Pepsi. Assume Coke and Pepsi are both ordinary goods. If both Coke and Pepsi increase their prices by 10%:
    (a) Demand for both will increase but demand for Coke will increase by a larger percentage.
    (b) Demand for both will decrease but demand for Coke will decrease by a larger percentage.
    (c) Demand for both will increase but demand for Pepsi will increase by a larger percentage.
    (d) Demand for both will decrease but demand for Pepsi will decrease by a larger percentage.

16. If a competitive firm's supply curve has a positive slope and the firm is currently producing a positive amount of output, then at its current level of output:
    (a) It's marginal costs will be increasing.
    (b) It's marginal costs will be constant.
    (c) It's marginal costs will be decreasing.
    (d) Either (a) or (b) could be true.
17. A consumer has a diminishing marginal rate of substitution and is currently at a bundle that is at a point of tangency between the budget line and an indifference curve. Which of the following is true?
    (a) All other bundles along the same indifference curve will cost more than the current bundle.
    (b) All other bundles along the budget line will cost more than the current bundle.
    (c) All other bundles along the same indifference curve will lead to greater utility.
    (d) All other bundles along the same indifference curve will lead to lower utility.
18. Suppose that a competitive firm is maximizing profits and producing a positive quantity of output. Which of the following is not necessarily true at the firm's current level of output?
    (a) Price is equal to marginal revenue.
    (b) Price is equal to marginal cost.
    (c) Marginal cost is greater than or equal to average cost.
    (d) Marginal cost is greater than or equal to average variable cost.
19. A quantity tax placed on consumers will tend to:
    (a) Increase the number of firms in the long run in a competitive industry.
    (b) Decrease the number of firms in the long run in a competitive industry.
    (c) Increase the price received by producers in the long run in a competitive industry.
    (d) Decrease the price received by producers in the long run in a competitive industry.
20. Suppose that the industry demand curve is linear and downward sloping. If the demand curve became flatter but still had the same vertical intercept as before:
    (a) The monopoly quantity and profits would both increase.
    (b) The monopoly quantity and profits would both decrease.
    (c) The monopoly quantity would increase but profits could go up or down.
    (d) The monopoly quantity would decrease but profits would go up or down.
21. For a normal, ordinary good:
    (a) The Engel curve will be upward sloping and the demand curve will be downward sloping.
    (b) The Engel curve will be downward sloping and the demand curve will be upward sloping.
    (c) Both the Engel curve and demand curve will be downward sloping.
    (d) Both the Engel curve and demand curve will be upward sloping.

22. Suppose that capital and labor are the only two inputs used by a firm. The marginal product of capital is constant and equal to 2. The marginal product of labor is constant and equal to 4. The firm:
    (a) Will use only capital if the price of capital is less than twice the price of labor.
    (b) Will use only capital if the price of capital is more than twice the price of labor.
    (c) Will use only capital if the price of capital is less than half the price of labor.
    (d) Will always use positive quantities of both capital and labor.

23. If a monopolist uses a two-part tariff in a market where the demand curve is downward sloping:
    (a) Consumer surplus will be larger than if the monopolist just charged a single price per unit without a fixed fee.
    (b) The quantity sold will be smaller than if the monopolist just charged a single price per unit without a fixed fee.
    (c) Producer surplus will be smaller than if the monopolist just charged a single price per unit without a fixed fee.
    (d) The price charged per unit will be lower than the price charged per unit without a fixed fee.

24. Suppose a person consumes only cake and ice cream. A doubling of the prices of cake and ice cream will:
    (a) Change the slope of the budget line and reduce the set of affordable bundles.
    (b) Change the slope of the budget line and increase the set of affordable bundles.
    (c) Reduce the set of affordable bundles but keep the slope of the budget line the same as before.
    (d) Increase the set of affordable budnels but keep the slope of the budget line the same as before.

25. A monopoly will be most likely to exist:
    (a) When demand is large relative to the minimum efficient scale.
    (b) When demand is small relative to the minimum efficient scale.
    (c) When there are no barriers to entry.
    (d) When products are very homogeneous.

SECTION II: SHORT ANSWER (40 points)

1. (14 points) There are ten firms producing bicycles (B). The firms are identical with each firm having the following cost function:

$$C(B) = \frac{1}{3}B^4 - \frac{3}{2}B^3 + 9B \tag{1}$$

The market for bicycles is competitive (firms are all price takers) with demand for bicycles given by:

$$D(p) = 90 - 2p \tag{2}$$

(a) At what price will firms shut down?
(b) Derive the *short run* industry supply function.
(c) Find the equilibrium price, quantity (for the market, not an individual firm) and number of firms in the *long run*.

2. (14 points) There is a single firm producing tables (T). The firm has fixed costs equal to \$100 and the firm's total costs increase by \$10 for each additional table they produce. The inverse demand curve for tables is given by:

$$p(T) = 200 - T \tag{3}$$

   (a) Write down an equation giving total costs for the firm as a function of T, the number of tables produced.
   (b) How many tables will the firm produce and what will firm profits be?
   (c) What is the socially efficient quantity of tables?
   (d) Calculate the deadweight loss generated by the firm acting as a monopolist.

3. (12 points) Suppose that a firm uses only capital and labor as inputs. The firm's production function is given by:

$$f(K, L) = K^{\frac{1}{2}} L^{\frac{1}{2}} \tag{4}$$

The price of a unit of capital is \$4 and the wage is \$1. The price of a unit of output is \$10.

(a) Derive expressions for the marginal product of labor and the marginal product of capital.
(b) Derive expressions for the optimal amount of labor as a function of output ($L(y)$) and the optimal amount of capital as a function of output ($K(y)$). Your expressions should contain only y and constants.
(c) Find an expression for total costs as a function of output ($C(y)$).