Ecn 100 - Intermediate Microeconomic Theory
University of California - Davis December 10, 2008
Professor John Parman

Final Examination

You have until 12:30pm to complete the exam, be certain to use your time wisely. For multiple choice questions, mark your answer on your scantron sheet. Choose only one answer for each multiple choice question; if more than one letter is chosen for a question it will be marked wrong. Write your answers for the short answer section directly on the exam. For the short answer questions, show your work clearly, place a box around final answers and be certain to label any graphs you draw. Final answers may be left as fractions. Non-graphing calculators may be used but they should not be necessary. Remember to put your name and ID number on both the exam (in the spaces provided below) and on the scantron sheet. Good luck!

Name: **ID Number:** **Section:**

SECTION I: MULTIPLE CHOICE (60 points)

1. The minimum of a firm's average cost curve is at \$20 and the minimum of the firm's average variable cost curve is at \$10. If the firm is operating in a competitive market where the price is \$15, then in the short run:
   (a) The firm will shut down.
   (b) The firm will earn positive profits.
   (c) The firm will have positive producer surplus.
   (d) The firm will be producing more than it would if the price were \$20.
2. An industry has three firms in it. Firms A and B each have individual supply curves given by $S(p) = -10 + 2p$ and firm C has a supply curve given by $S(p) = 4p$. The industry supply curve will have a kink at a price of:
   (a) \$5.
   (b) \$10.
   (c) \$.25.
   (d) \$.25 and \$5.
3. If a monopoly can use first degree price discrimination, the deadweight loss will be ____ than if the monopoly cannot price discriminate and profits will be ____ than if the monopoly cannot price discriminate. (You can assume the monopoly has constant marginal costs and the every consumer's demand curve is a downward sloping line.)
   (a) Greater than, less than.
   (b) Greatern than, greater than.
   (c) Less than, less than.
   (d) Less than, greater than.

4. A major difference between a competitive firm and a monopoly is that:
   (a) Monopolies operate where marginal revenue equals marginal cost, competitive firms do not.
   (b) Monopolies earn profits, competitive firms do not.
   (c) Competitive firms operate where marginal revenue equals marginal cost, monopolies do not.
   (d) Competitive firms operate where price equals marginal cost, monopolies do not.

5. If a production technology exhibits increasing returns to scale, then producing 100 units of output will cost ____ as producing 50 units of output.
   (a) Twice as much.
   (b) More than twice as much.
   (c) Less than twice as much.
   (d) Not enough information.

6. A firm's cost function is given by: $C(y) = 24y^2 + 8y + 16$. What is the firm's average fixed cost when it produces 10 units of output?
   (a) \$248.
   (b) \$249.60.
   (c) \$1.60.
   (d) \$488.

7. If a person consuming goods x and y has standard, convex indifference curves, utility is maximized at the point where:
   (a) The budget line is tangent to the indifference curve.
   (b) The marginal utility of x is equal to the marginal utility of y.
   (c) The money spent on x is equal to the money spent on y.
   (d) The quantity of x is equal to the quantity of y.

8. There are two types of consumers for bagels, students and professors. Both students and professors stop consuming bagels when the price of bagels goes above \$5. For every decrease in the price of bagels by a dollar, student demand goes up by five bagels while professor demand goes up by 10 bagels. If a monopolist has a constant marginal cost of \$1 and can charge different prices to students and professors, which group will be charged a higher price?
   (a) Professors.
   (b) Students.
   (c) They will be charged the same price.
   (d) Not enough information.

9. A firm's marginal cost curve will:
   (a) Always lie below its average cost curve.
   (b) Always lie above its average fixed cost curve.
   (c) Pass through the minimum of the average cost curve.
   (d) Always be upward sloping.

10. If a consumer's indifference curves for apples and oranges are straight lines, we can say for certain that:
    (a) The consumer prefers averages to extremes.
    (b) The consumer prefers extremes to averages.
    (c) The consumer will always consume the same ratio of apples to oranges.
    (d) The consumer's marginal rate of substitution is constant.

11. Suppose that in the short run, a firm's average cost when producing 100 tables is \$20 and the firms average cost of producing 200 tables is \$30. Then we can say for certain that in the long run:
    (a) The average cost of producing 100 tables will be \$20.
    (b) The average cost of producing 200 tables will be less than or equal to \$30.
    (c) The average cost of producing 100 tables will be less than the average cost of producing 200 tables.
    (d) (b) and (c).

12. Which of the following is true about a competitive firm's short run supply:
    (a) The firm will never produce at a quantity where the marginal cost curve is downward sloping.
    (b) The firm will never produce at a quantity where the average variable cost curve is downward sloping.
    (c) The firm will never produce at a quantity where the average cost curve is downward sloping.
    (d) (a) and (b).

13. Suppose that a firm uses butter and flour to produce biscuits. The slope of the firm's isocost curves will depend on:
    (a) The prices of butter and flour.
    (b) The price of bisuits.
    (c) The marginal product of butter and the marginal product of flour.
    (d) (a) and (b).

14. Suppose burritos are a normal, ordinary good. If the price of burritos decreases, then the income and substitution effects for burritos will:
    (a) Both be negative.
    (b) Both be positve.
    (c) Have opposite signs but the same magnitude.
    (d) Have opposite signs and different magnitudes.

15. Suppose there is a monopoly selling to several different types of consumers. Consider the profits when the firm can use first degree price discrimination (π_{1st}), second degree price discrimination (π_{2nd}) and third degree price discrimination (π_{3rd}). Which ordering of these profits is correct:
    (a) $\pi_{1st} \geq \pi_{2nd} \geq \pi_{3rd}$
    (b) $\pi_{3rd} \geq \pi_{2nd} \geq \pi_{1st}$
    (c) $\pi_{1st} \geq \pi_{3rd} \geq \pi_{2nd}$
    (d) $\pi_{3rd} \geq \pi_{1st} \geq \pi_{3rd}$
16. In a competitive industry with no barriers to entry or exit, the short run industry supply curve will typically be ____ and the long run industry supply curve will be ____.
    (a) Upward sloping, upward sloping.
    (b) Upward sloping, horizontal.
    (c) Downward sloping, horizontal.
    (d) Upward sloping, vertical.
17. Suppose at its current level of production in a competitive industry, a firm's marginal costs are \$40, its average variable costs are \$50 and the market price is \$40. We can say for certain that:
    (a) The firm is maximizing profits.
    (b) The firm is earning positive profits.
    (c) The firm is earning negative profits.
    (d) (a) and (c).
18. If the government forced a monopoly to operate at the socially efficient quantity, what must be true?
    (a) The monopoly will be losing money.
    (b) The monopoly will be earning positive profits.
    (c) The monopoly's marginal cost curve will intersect the demand curve at the efficient quantity.
    (d) The monopoly's producer surplus will be negative.
19. If two goods are complements, then an increase in the price of one good will:
    (a) Decrease demand for the other good.
    (b) Increase demand for the other good.
    (c) Have no effect on demand for the other good.
    (d) Not enough information.
20. For an industry with an upward sloping supply curve and a downward sloping demand curve, a quantity tax placed on consumers will:
    (a) Decrease consumer surplus and decrease producer surplus.
    (b) Generate deadweight loss.
    (c) Have the same effect as a quantity tax of the same amount placed on producers.
    (d) All of the above.

21. Which of the following guarantees that a firm's producer surplus is equal to its profits?
    (a) The firm has no fixed costs.
    (b) If the firm's fixed costs are equal to its variable costs.
    (c) The price is above the firm's breakeven price.
    (d) The firm is producing a positive amount of output.
22. Which of the following is definitely true about a tax that generates a deadweight loss?
    (a) The tax decreases total surplus.
    (b) The decrease in consumer and producer surplus will be equal to the deadweight loss.
    (c) The decrease in consumer and producer surplus will be greater than the deadweight loss.
    (d) The decrease in consumer and producer surplus will be equal to the tax revenues.
23. Suppose a firm has three factories, A, B and C. Each factory has constant marginal costs and the marginal cost at factory A is less than the marginal cost at factory B which is less than the marginal cost at factory C ($MC_A < MC_B < MC_C$). Which of the following statements is definitely true if the firm is maximizing profits?
    (a) The firm will produce at all three factories.
    (b) The firm will produce more at factory B than at factory C.
    (c) The firm will not produce any units at factory C.
    (d) The level of production at factory B will depend on the market price of output.
24. If demand is perfectly inelastic, the the demand curve will be:
    (a) A vertical line.
    (b) A horizontal line.
    (c) A line with a slope of 1.
    (d) A line with a slope of -1.
25. In a competitive industry, the current price is $25 and marginal costs are greater than average costs for each firm at their current level of output. What would we expect to happen to the number of firms in the industry?
    (a) The number of firms will increase.
    (b) The number of firms will decrease.
    (c) The number of firms will stay the same.
    (d) The number of firms will incresae in the short run but decrease in the long run.

SECTION II: SHORT ANSWER (40 points)

For this section, be certain to show your work and clearly label any graphs you draw. Give complete answers but keep them concise. Please place a box around final answers where appropriate.

1. (15 points) Suppose that a firm's cost function for producing xylophones is given by $C(x) = 8x^2 + x + 2$, where x is the number of xylophones being produced. The market for xylophones is perfectly competitive.
   (a) Find expressions for the average cost, average variable cost and marginal cost functions for the firm in terms of the number of xylophones produced.
   (b) Graph the functions you found in part (a). Be certain to label any minimums, including the value of x at which those minimums occur.
   (c) Above what price does the firm earn positive profits?
   (d) In the long run, all firms in the industry have an average cost function given by $AC(x) = x^2 - 20x + 110$. The demand curve for the industry is given by $D(p) = 1020 - 2p$. Find the equilibrium price, output per firm and number of firms in the long run.

2. (15 points) A monopolist in the market for good x has the following cost function: $C(x) = 20x + 100$. The inverse demand function for good x is given by: $p(x) = 1520 - \frac{3}{2}x$.
   (a) Find an expression for the marginal revenue for the firm in terms of x.
   (b) Find the the quantity sold by the monopoly and the price charged.
   (c) Find the socially efficient quantity.
   (d) Calculate the deadweight loss in the monopoly outcome compared to the socially efficient outcome.

3. (10 points) A firm is operating in the perfectly competitive market for widgets. The firm has two different factories, A and B, and must decide how to split its production between the two factories when the market price for widgets is \$160. The cost functions for the two factories are:

$$C_A(w_A) = 10w_A^2 \tag{1}$$

$$C_B(w_B) = 40w_B^2 \tag{2}$$

   (a) What percentage of widgets produced by the firm are made at factory A?
   (b) Given that the market price for a widget is \$160, how many widgets total does the firm produce?