

**Economics 101 – Lec 3**  
**Elizabeth Kelly**  
**Fall 2000**  
**Midterm #3 / Version #1**  
**December 4, 2000**

**Student Name:** \_\_\_\_\_  
**ID Number:** \_\_\_\_\_  
**Section Number:** \_\_\_\_\_  
**TA Name:** \_\_\_\_\_

**VERSION 1**

**TF+MC** \_\_\_\_\_  
**Problem** \_\_\_\_\_  
**Total** \_\_\_\_\_

**NOTE: This information and the similar information on the bubble sheet are worth 2 points.**

**DO NOT BEGIN WORKING  
UNTIL THE INSTRUCTOR TELLS YOU TO DO SO.  
READ THESE INSTRUCTIONS FIRST.**

You have the class period of 50 minutes to complete the exam. The exam consists of three parts: 5 true/false questions, 12 multiple choice questions, and 1 problem. Each true/false question is worth 2 points for a total of 10 points, each multiple choice question is worth 3 points for a total of 36 points, and the problem is worth 12 points. Please answer all true/false questions and multiple choice questions on the coding sheet with a #2 **pencil**. Choose the best answer. Answer the problem on the exam booklet. Please make sure you write legibly and are clear about the solution to the problem. **No calculators are allowed.** Please fill out the blanks at the top of the exam booklet. There are 10 pages in this exam booklet.

**How to fill in the coding sheet:**

1. Print your last name, first name, and middle initial in the spaces marked “Last Name,” “First Name,” and “MI.” Fill in the corresponding bubbles below.
2. Print your student ID number in the space marked “Identification Number.” Fill in the corresponding bubbles below.
3. Write your discussion section number under “Special Codes” spaces **A****B****C**, and fill in the bubbles. You can find the discussion numbers below on this page.
4. Write your version number under “Special Codes” space **D**, and fill in the bubble.

**Note that filling in the bubble sheet correctly, and providing the information required in the box on the upper right corner of this page is worth 2 points.**

- If you have any questions during the exam, stay seated and raise your hand.
- When you are finished, please get up quietly and bring your code sheet and this exam booklet to the place indicated by the instructors.

**DISCUSSION SECTIONS:**

Disc 381	9:55W	215 Ingraham	Oya Ardic	Disc 390	2:25R	6228 Soc Sci	Seungmoon Choi
Disc 382	11:00W	115 Ingraham	Oya Ardic	Disc 391	3:30R	1412 Sterling	Seungmoon Choi
Disc 383	12:05W	6102 Soc Sci	Tsung-Sheng Tsai	Disc 392	9:55F	B333 Van Vleck	Seungmoon Choi
Disc 384	1:20W	6310 Soc Sci	Tsung-Sheng Tsai	Disc 393	9:55F	122 Ingraham	Tsung-sheng Tsai
Disc 385	2:25W	55 Bascom	Zhonghua Wu	Disc 395	12:05F	B129 Van Vleck	Seungmoon Choi
Disc 386	3:30W	6314 Soc Sci	Zhonghua Wu	Disc 396	11:00F	14 Ingraham	Seungmoon Choi
Disc 387	11:00R	6322 Soc Sci	Zhonghua Wu	Disc 397	11:00F	B305 Van Vleck	Tsung-Sheng Tsai
Disc 389	12:05R	114 Ingraham	Zhonghua Wu	Disc 398	12:05F	23 Ingraham	Tsung-Sheng Tsai

**PART I: TRUE/FALSE QUESTIONS (2 points each: Allow 5 minutes)**

On the coding sheet, darken choice **A** if you think the statement is **TRUE**, and darken choice **B** if you think the statement is **FALSE**.

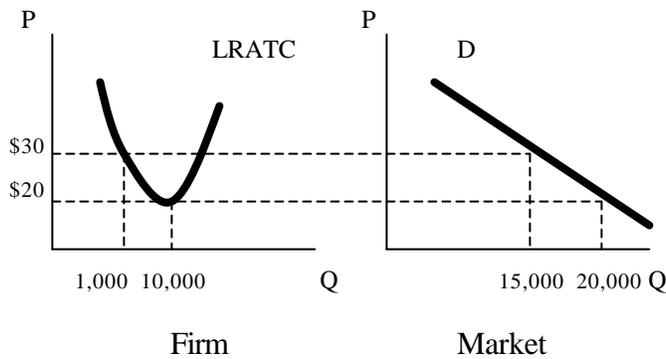
**Question 1:** It is possible for a firm to experience diminishing marginal returns in the long-run.

- A. True
- B. False

**Question 2:** A monopolist profit maximizes by producing that level of output where marginal revenue equals marginal cost and charging a price greater than the average total cost of production.

- A. True
- B. False

**Question 3:** The market described by the following graph is consistent with the market being an oligopoly.



- A. True
- B. False

**Question 4:** In the long-run a firm will always earn zero economic profit, but it could have a positive accounting profit.

- A. True
- B. False

**Question 5:** If the total cost function is given by  $TC = 10,000 + 10Q + 85\sqrt{Q}$ , the associated total fixed cost and total variable functions are given by:  $TFC = 10,000$  and  $TVC = 10Q + 85\sqrt{Q}$  respectively.

- A. True
- B. False

**PART II: MULTIPLE CHOICE QUESTIONS (3 points each: allow 24 minutes)**

**Question 6:** K-Mart and Wal-Mart are considering establishing either 1 or 2 stores in a town. The payoff matrix, which gives the profits of each company, is as follows (profits are in million dollars):

		Wal-Mart	
		One	Two
K-Mart	One	10	12
	Two	6	5

The upper triangle of each box corresponds to Wal-Mart's profits whereas the lower triangle shows K-Mart's profits. What is the equilibrium outcome in this game? K-Mart builds \_\_\_\_\_ store(s) and Wal-Mart builds \_\_\_\_\_ store(s).

- A. (1, 1).
- B. (2, 1).
- C. (1, 2).**
- D. (2, 2).
- E. There is no equilibrium in this game.

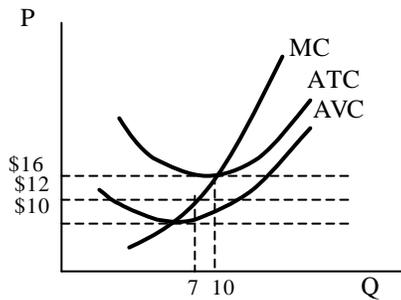
**Question 7:** Suppose the demand and supply in a perfectly competitive market are as follows:

**Demand:**      $P = 20 - 0.005Q$   
**Supply:**      $P = 0.005Q$

A representative firm in the perfectly competitive market has a marginal cost,  $MC = 10Q$ . In the short run, the profit-maximizing output is \_\_\_\_\_ units for an individual firm and the equilibrium price is \_\_\_\_\_.

- A. (10,10)
- B. (10,100)
- C. (1,10)**
- D. (1,100)
- E. (0.1,10)

**Question 8:**



The figure above shows the cost structure of a representative firm in a perfectly competitive market. Suppose the current market equilibrium price is \$12. Which of the following statements is FALSE?

- A. The marginal revenue curve for the firm is  $P = \$12$ .
- B. There is a negative economic profit in the short run.
- C. The long-run equilibrium price is \$16.
- D. In the short run, this firm will shut down the business and leave the market.
- E. In the long run, if there are 100 firms staying in this market, the equilibrium quantity will be 1,000 units.

**Question 9:** Which of the following is TRUE?

- A. A monopolistically competitive firm does not produce at its minimum ATC in the long-run.
- B. A monopolistically competitive firm cannot successfully maintain positive economic profits in the long-run.
- C. Barriers to entry make it possible for monopolies to earn positive economic profits in the long-run.
- D. (A) and (C).
- E. (A), (B) and (C).

**Question 10:** A monopolist has cost function  $TC = 10 + 2Q$ . Demand in this market is given by the equation  $Q = 14 - P$ . If this monopolist can charge only a single price, its profit in the short run will be:

- A. -8
- B. 10
- C. 26
- D. 34
- E. 46

**Question 11:** Which of the following statements is NOT a characteristic of a perfectly competitive market?

- A. The equilibrium output is both allocatively and productively efficient.
- B. While firms in a perfectly competitive market can make positive, zero, or negative economic profits in the short-run, they have to make zero economic profits in the long-run.
- C. Marginal revenue for a perfectly competitive firm is equal to the market price because firms in a perfectly competitive market are price takers.
- D. In the short-run, a perfectly competitive firm will continue production as long as it can cover its total variable costs.
- E. There are many firms in a perfectly competitive market that produce differentiated products.

**Question 12:** A regulated natural monopolist practicing average cost pricing

- A. makes zero economic profit.
- B. produces an allocatively inefficient level of output.
- C. produces the largest quantity possible while still enabling the firm to cover its total costs.
- D. all of the above.
- E. none of the above.

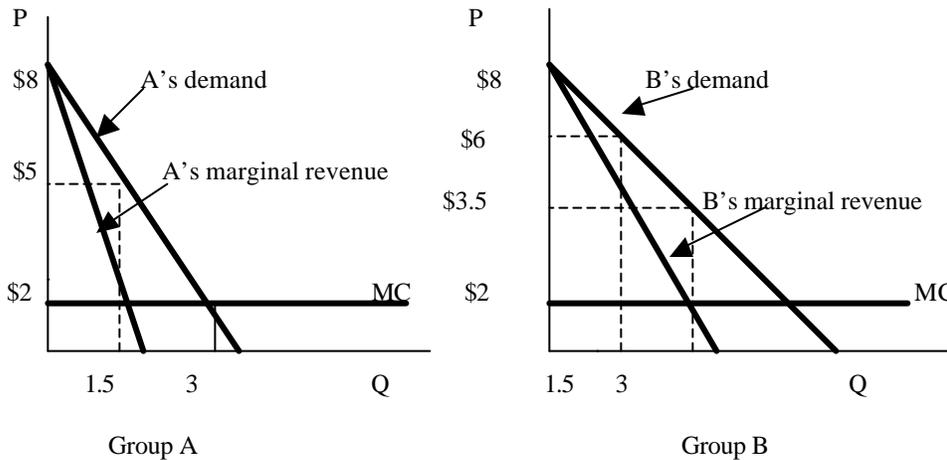
**Question 13:** Which of the following is an example of perfect price discrimination?

- A. lower air fares for customers willing to stay over a Saturday night.
- B. discount movie tickets for children and senior citizens.
- C. discounts for seats with an obstructed view in a theater.
- D. higher phone rates on weekdays than on weekends.
- E. none of the above.

**Question 14:** Which of the following statements about cost functions is TRUE?

- A. If there is an increase in total fixed costs (TFC), average variable costs (AVC) will increase.
- B. A firm that has increasing average costs as output expands experiences increasing returns to scale.
- C. Marginal cost is not affected by changes in fixed costs.
- D. As the level of output increases, the difference between average total cost (ATC) and average variable cost (AVC) widens.
- E. If marginal cost is less than average variable cost, then the average variable cost is increasing.

**Question 15:** A monopolist sells a single product and its consumers fall into two groups, group A and group B. The marginal cost of producing the good is constant at \$2 and is equal for both groups. The two graphs below depict the demand curves and the marginal revenue curves for each of the two groups:



Suppose that the monopolist can distinguish between the two groups and engages in price discrimination. Which of the following is true if the monopolist maximizes its profits?

- A. The price charged to group A is greater than the price charged to group B. The quantity sold to group A is greater than the quantity sold to group B.
- B. The price charged to group A equals the price charged to group B. The quantity sold to group A equals the quantity sold to group B.
- C. The price charged to group A is greater than the price charged to group B. The quantity sold to group A is less than the quantity sold to group B.
- D. The price charged to group A is less than the price charged to group B. The quantity sold to group A is greater than the quantity sold to group B.
- E. The price charged to group A is less than the price charged to group B. The quantity sold to group A is less than the quantity sold to group B.

**Question 16:** Which of the following statements about market structures is TRUE?

- A. All unregulated firms, regardless of the type of the market they are in, are productively efficient.
- B. A perfect price discriminating monopoly is allocatively efficient.
- C. Monopolistically competitive firms do not operate at the minimum cost per unit in the long-run.
- D. Oligopolistic markets are characterized by strategic interactions.
- E. All of the above

**Question 17:** The following table provides information about long-run average cost curve of a firm:

Q	LRAC
100	50
200	43
300	39
400	39
500	44
600	52

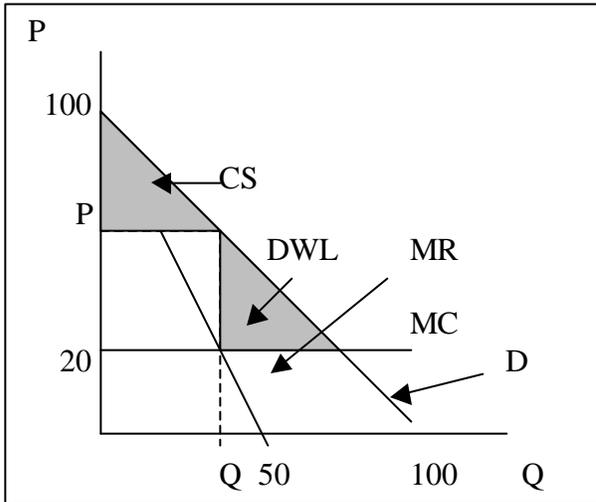
Which of the following statements is TRUE about this firm?

- A. For the first 300 units of output, this firm has decreasing returns to scale.
- B. For output levels between 300 and 400, the firm has constant returns to scale.
- C. For output levels greater than 400, the firm has increasing returns to scale.
- D. This cost structure is an example of natural monopoly.
- E. All of the above

**PART III: PROBLEM (12 points: allow 21 minutes)**

Please write legibly. Make sure to show ALL your work. You may not receive any credit if you fail to show your work. Put your answers for each part in the respective blanks provided.

Suppose a monopoly faces the following demand curve for its product:



The equations for the demand curve and the marginal revenue curve are given as follows:

$$D: P = 100 - Q$$

$$MR: MR = 100 - 2Q$$

From the demand curve the monopolist obtains its marginal revenue curve, which has been also drawn in the graph above. Note that both curves are linear.

- A. (3 points) Suppose the monopolist has constant marginal costs of production given by  $MC = 20$  and total costs given by  $TC = 20Q + 1000$ . Using this information and the information above on the graph mark:

- The monopolist's quantity  $Q$
- The monopolist's price  $P$
- Draw the  $MC$  curve

Then, numerically calculate:

- The monopolist's optimal quantity ( $Q$ ) = 40 units
- The price the monopolist will charge ( $P$ ) = \$60

Profit maximization condition:  $MR = MC \Rightarrow 100 - 2Q = 20 \Rightarrow Q = 40$  units

Use the demand curve to find the price that the monopolist will charge for  $Q = 40$ :

$P = 100 - Q = 100 - 40 \Rightarrow P = \$60$

B. (3 points) Find the consumer surplus that is associated with the monopolist's optimal price/quantity combination. On the graph:

- label the consumer surplus for the monopolist

Calculate:

- the dollar value of the consumer surplus if the firm is a monopolist equals \$800 .
- the dollar value of the consumer surplus if this was a perfectly competitive industry equals \$3200 .

Consumer Surplus in Monopoly:

$$CS = (40)(40)/2 = \$800$$

If the market was perfectly competitive, price would be \$20 and equilibrium quantity would be 80 units (solve for the point where MC crosses the demand curve).

Consumer Surplus in Perfect Competition:

$$CSPC = (80)(80)/2 = \$3200$$

C. (3 points)

- Discuss the efficiency properties of the monopolist's optimal price/quantity combination.
- On the graph label the area that corresponds to dead-weight loss.
- The dollar value of the dead-weight loss equals \$600 .

The monopolist's optimal output level is allocatively inefficient. Too few of the good is produced. This creates a deadweight loss.

$$DWL = (40)(40)/2 = \$800$$

**D. (3 points)**

- Suppose now that the government decides to auction off a license to be the monopoly provider of this good for one year. Using all the information given above, decide how much the monopolist that we have analyzed in parts (a), (b), and (c) would be willing to pay for this license.

The profits available from the firm that will have the monopoly rights equal:

$$\text{Profits} = \text{TR} - \text{TC}$$

$$\text{TR} = P \cdot Q = (60)(40) = \$2400$$

$$\text{TC} = 20Q + 1000 = (20)(40) + 1000 = \$1800$$

$$\text{Profits} = 2400 - 1800 = \$600$$

Since there will be many firms bidding for the monopoly rights, the winning bid for the license in the auction will be equal to the potential profits.

- Suppose the government gives consumers the auction proceeds (thus augmenting their consumer surplus). Rank the following three choices according to consumers' preferences where 1 is the best choice from the consumers' point of view and 3 is the worst choice from their point of view:

  3   Firm is a monopoly

  1   Market is perfectly competitive

  2   Monopolist's rights are auctioned off with consumers receiving this payment.

Make sure you support your argument with a numerical analysis using the information above and your answer for part (B)

Consumer surplus when the monopoly rights are auctioned:

$$\begin{aligned} \text{CSMR} &= \text{Consumer Surplus in Monopoly (from part (B))} + \text{Price paid for the license} \\ &= \$800 + \$600 = \$1400 \end{aligned}$$

<b>A.</b> _____
<b>B.</b> _____
<b>C.</b> _____
<b>D.</b> _____
<b>Total:</b> _____