AMERICAN UNIVERSITY of BEIRUT
OLAYAN SCHOOL of BUSINESS
BUSS 230 MANAGERIAL ECONOMICS

FINAL EXAM – June 11, 2005

NAME: _____ **ID:** _____

SECTION: _____ **INSTRUCTOR:** _____

ANSWER ALL QUESTIONS – TIME ALLOWED: 2 hours

I. **Multiple choices - (24 points). On this sheet, please circle the correct answer. A correct answer is worth 2 points.**

1. If the output elasticities of all inputs used by a firm are added together, then the sum will be:
   a. Greater than one if returns to scale are decreasing.
   b. Equal to one if returns to scale are constant.
   c. Less than one if returns to scale are increasing.
   d. All of the above are correct.

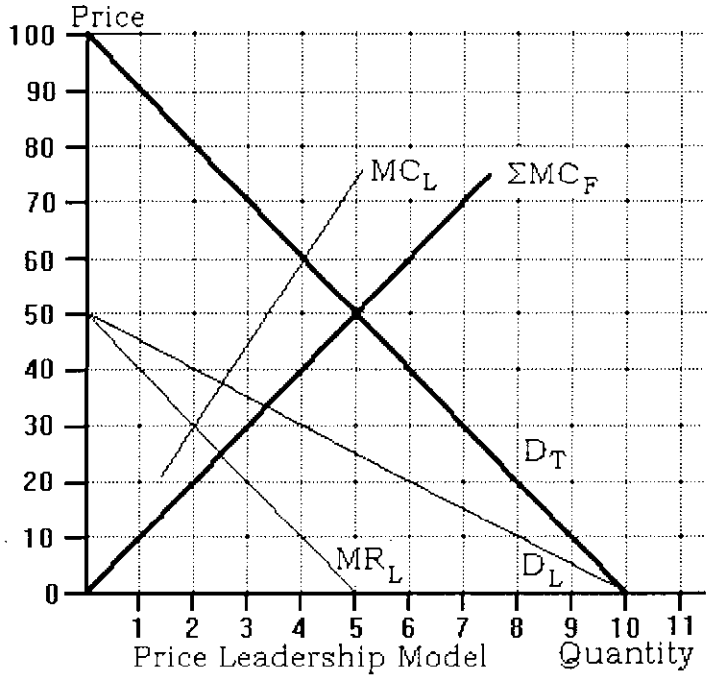
2. Short-run marginal cost is equal to the:
   a. Change in total cost divided by the change in output.
   b. Change in total variable cost divided by the change in output.
   c. Cost per unit of the variable input divided by the marginal product of the variable input.
   d. All of the above.

3. One reason that a firm may experience increasing returns to scale is that higher levels of output make it possible for the firm to:
   a. Employ more specialized machinery.
   b. Obtain discounts on bulk purchases.
   c. Employ a greater division of labor.
   d. All of the above are correct.

4. A monopolist faces a demand function defined as $Q = 40 - 2P$. The monopolist's marginal cost is equal to $15 at all levels of output. How many units of output should the firm produce in order to maximize profits?
   a. 5.
   b. 7.5.
   c. 10.
   d. None of the above.

5. An imperfectly competitive firm is producing a level of output at which marginal cost is equal to marginal revenue while at the same time marginal revenue is less than average variable cost, and price is equal to average total cost. The firm should:
    a. Shut down.
    b. Continue to operate but decrease output.
    c. Continue to operate but increase output.
    d. None of the above is correct.

6. When a perfectly competitive industry is in long-run equilibrium, all firms in the industry:
    a. Earn zero economic profit.
    b. Produce a level of output where short-run marginal cost is equal to short-run average total cost.
    c. Produce a level of output where long-run marginal cost is equal to long-run average cost.
    d. Experience all of the above.



7. Refer to the price leadership graph above. The equilibrium **price** is:
    a. $40.
    b. $50.
    c. $60.
    d. None of the above is correct.

8. Refer to the price leadership graph above. The **quantity** supplied by the **Followers** is:
    a. 2 units.
    b. 3 units.
    c. 4 units.
    d. None of the above is correct.

9. Oligopolistic firms can earn positive economic profits
    a. In the short-run but not in the long run.
    b. In the short-run and in the long run.
    c. In the long run but not in the short-run.
    d. In neither the short-run or in the long run.

10. If the fully allocated cost of a product is $10, and the price elasticity of demand for the product is –2, then the optimal markup would be:
    a. 10%.
    b. 50%.
    c. 100%.
    d. 200%.

11. A firm produces watches at a constant Marginal Cost of $10 and sells them on two different markets (A and B). Demand in market A is $Q_A = 80 - 2P$. Demand in market B is $Q_B = 50 - P$. What price should be charged for the watches in market B to optimize the firm's profits?
    a. $20.
    b. $30.
    c. $40.
    d. $50.

12. Which of the following situations is **not** an example of price discrimination?
    a. Charging less for regular gasoline sold at a service station than for premium gasoline.
    b. Charging less for a child's admission to an amusement park than for an adult's admission.
    c. Charging more for making a long-distance telephone call during the day than it does late at night.
    d. Charging more for evening performance at the movies than for afternoon performance.

The rest of the exam should be answered on your BLUE book.

II. True/False – (16 Points).

On your blue book, label each of the following statements as either T (true) or F (false) and briefly justify the answer. You will receive no credit for a correct answer not accompanied by a justification or one that is accompanied by a wrong justification.

1. If a learning curve is represented by the exponential equation $\mathbf{AC = aQ^n}$, the exponent "n" should be positive and greater than 1.

2. Break-even analysis **cannot** be used to plan for **future** profit since it serves only to identify the boundary between profit and loss.

3. If a perfectly competitive firm is producing a level of output at which its **marginal cost exceeds market price**, it should raise its price.

4. As more **firms enter** a monopolistically competitive industry, the market supply curve shifts to the right.

5. One **harmful effect** of oligopolistic industries is that firms in such industries spend too much on research and development.

6. The **Theory of Contestable Markets** holds that an industry with no barriers to entry or exit will operate as if it were perfectly competitive.

7. If a firm that **did not practice price discrimination** begins to practice first-degree price discrimination, its profit will increase by an amount equal to the consumers' surplus.

8. **Perfectly competitive** firms cannot engage in either first-degree or second-degree price discrimination, but only in third-degree price discrimination.

III Problem (15 points).

(a) Two grocery stores compete with each other in a community. Both are considering whether to advertise or not. Their interdependent alternatives are indicated in the **payoff matrix presented below** (where the first number in each box refers to the profits of Firm 1 and the second number to the profits of Firm 2).

		Firm 2	
		Advertise	Don't Advertise
Firm 1	Advertise	5,3	6,5
	Don't Advertise	4,5	2,3

(i) For 3 points. Determine whether either store has a dominant strategy and, if it exists, identify the strategy.
(ii) For 3 points. Determine the NASH equilibrium, if one exists.
(iii) For 3 points. Is the above situation a prisoners' dilemma situation? Explain your answer.

(b) For 6 points. Assume now that you are analyzing the situation of two other firms, Firm A and Firm B. The two firms have joined forces to operate as a centralized cartel. Their **marginal cost** functions are defined below:

$$MC_A = 25\,Q_A \qquad \text{and} \qquad MC_B = 6.25\,Q_B$$

The cartel faces the following **market demand** function:

$$Q = 1{,}000 - 0.10P$$

Determine: (i) the market price that should be charged and (ii) the quantity of output that should be produced by **each** firm.

IV. Problem (15 points). Consider the following short-run production function in which Q stands for output and L for the variable input, labor:

$$Q = 5 + 6\,L - 0.4\,L^2$$

Assuming that the output can be sold for $5 per unit and that the firm can hire as much labor as needed for a wage of $6 per worker.

a. **For 3 points.** Determine the equation for the marginal product of labor.
b. **For 3 points.** Determine the equation for the marginal revenue product.
c. **For 3 points.** At which level of labor utilization does output reach its maximum level?
d. **For 3 points.** Determine the optimal number of workers to be hired if the firm wishes to maximize profits.
e. **For 3 points.** Explain why the marginal revenue product curve (if you were asked to draw it) would be negatively sloped.

V. Problem (15 points). The **short-run** demand function and total cost function for a product sold by a **monopolistically competitive** firm are given below:

$$Q = 84 - 0.4\,P$$

$$TC = Q^3 - 10\,Q^2 + 60\,Q + 1{,}000$$

a. **For 5 points.** Calculate the short-run equilibrium price and output.
b. **For 3 points.** Calculate the firm's total profit at the above-determined price/output levels.
c. **For 3 points.** If fixed costs were 1,200 instead of 1,000 (shown above), how would your answers to parts (a) and (b) above change?
d. **For 4 points.** What would you expect to happen to the firm's profit in the **long run**? Explain the adjustment process.

VI. Problem (15 points). Jeep CHEROKEE cars are assembled by the Daimler-Chrysler Corporation's JEEP division using standard engines. The engines may be obtained either from another division within the parent corporation or bought from an outside manufacturer on the perfectly competitive external market. Assume that the critical information regarding demands and costs is as follows:

Consumer demand for Jeep Cherokees: $Q = 500{,}000 - 10\,P$
Cost of producing engines at Daimler-Chrysler: $MC = 400 + 0.025\,Q$
Cost of assembling and selling Jeep Cherokees: $MC = 2{,}250 + 0.25\,Q$
Total market demand for engines: $Q_d = 2{,}000{,}000 - 400\,P$
Total market supply of engines: $Q_s = -200{,}000 + 400\,P$

a. **For 5 points.** What are the optimal production quantity and price of Jeep Cherokees?
b. **For 5 points.** How many Jeep engines should be produced within the corporation and how many, if any, should be procured externally?
c. **For 5 points.** What price should be paid for engines procured within the corporation and for any engines procured externally?