



AMERICAN UNIVERSITY of BEIRUT

OLAYAN SCHOOL of BUSINESS

BUSS. 230

FINAL EXAM

Thursday, June 3, 2004



NAME: _____ ID: _____

SECTION: _____ INSTRUCTOR: _____

ANSWER ALL QUESTIONS. TOTAL TIME ALLOWED: 2 hours

I. **Multiple choice (20 points total).** On this paper, circle the correct answer in each of the following 20 questions – (1 point for each correct answer)

1. Unionized workers may be able to negotiate with management for higher wages during periods of economic prosperity. Suppose that workers at automobile assembly plants successfully negotiate a significant increase in their wage package. How would the new wage contract be likely to affect the market supply for new cars?
 - a. Supply will shift to the right.
 - b. Supply will shift to the left.
 - c. Supply will not be affected, but the quantity of cars produced per month will decrease.
 - d. Supply will not be affected, but the quantity of cars produced per month will increase.
 - e. There will be no effect on either supply or demand.

2. If a firm's total revenue function is a straight line that begins at the origin, then:
 - a. Marginal revenue is zero.
 - b. Average revenue is zero.
 - c. Marginal revenue is equal to average revenue.
 - d. Marginal revenue is greater than average revenue.
 - e. Marginal revenue is less than average revenue.

3. A firm faces a linear demand function defined as $Q = 120 - 4P$. If the price is 5, what is the point price elasticity of demand?
 - a. -4.
 - b. $-1/4$.
 - c. -0.2 .
 - d. $1/4$.
 - e. 4.

4. Which of the following **will not** decrease the demand for a commodity?
 - a. The price of a substitute commodity decreases.
 - b. Income declines and the good is normal.
 - c. The price of a complementary commodity increases.
 - d. The price of the commodity increases.
 - e. Consumer tastes change.

5. Multiple regression analysis is used when:
 - a. There are not enough data to carry out simple linear regression analysis.
 - b. The dependent variable depends on more than one independent variable.
 - c. One or more of the assumptions of simple linear regression are not correct.
 - d. The relation between the dependent variable and the independent variables cannot be described by a linear function.
 - e. The regression has to be estimated in several tries.

6. The root-mean-square error is a measure of:
 - a. Sample dispersion.
 - b. Moving average variability.
 - c. Exponential smoothing reliability.
 - d. Forecast accuracy.
 - e. Auto-correlation of the deviations.

7. The marginal product of labor is equal to:
 - a. The additional labor required for producing one additional unit of output.
 - b. The average product of labor when the average product is at a minimum.
 - c. The additional output produced by hiring one more unit of labor.
 - d. The slope of a ray drawn from the origin to a point on the total product curve.
 - e. All of the above are correct.

8. If the output elasticities of all inputs used by a firm are summed together, then the total:
 - a. Will be greater than one if returns to scale are decreasing.
 - b. Will be equal to one if returns to scale are constant.
 - c. Will be less than one if returns to scale are increasing.
 - d. Will always exceed one in the long run.
 - e. Will always exceed one in the short run.

9. Learning curves represent the relationship between:
 - a. Average variable cost and the number of units produced per time period.
 - b. Average variable cost and the cumulative number of units produced.
 - c. Total cost and the application of new technology.
 - d. Average variable cost and the rate of increase in technology.
 - e. The speed at which labor can be trained on the job.

10. The law of diminishing returns starts to operate at the level of output where:
- Marginal cost is at a minimum.
 - Average variable cost is at a minimum.
 - Average fixed cost is at a minimum.
 - Average total cost is at a minimum.
 - None of the above is correct.
11. The contribution margin per unit is equal to the:
- Price of a good.
 - The difference between total revenue and total cost.
 - The difference between price and average total cost.
 - The difference between price and average variable cost.
 - The difference between price and average fixed costs.
12. Which of the following markets comes closest to satisfying the assumptions of a perfectly competitive market structure?
- The stock market (market for company shares).
 - The market for agricultural commodities such as wheat or corn.
 - The market for petroleum and natural gas.
 - All of the above.
 - None of the above.
13. A depreciation of the Lebanese pound relative to foreign currencies will make:
- Foreign imports less expensive in Lebanon.
 - Lebanese exports less expensive in foreign markets.
 - The demand for Lebanese exports decrease.
 - The Lebanese demand for imports increase.
 - Prices in Lebanon lower.
14. Which of the following types of firms is **most likely** to be a monopolistic competitor?
- A local telephone company.
 - An automobile manufacturer.
 - A restaurant.
 - A manufacturer of pharmaceutical products.
 - All of the above.
15. Some economists have suggested that oligopolists tend to maintain prices unchanged when there are changes in their costs of production. Which of the following models is used to explain such behavior?
- Price leadership.
 - Centralized cartel.
 - Nash equilibrium.
 - Dominant strategy.
 - Kinked-demand curve.

16. A cartel that operates like a multi-plant monopolist is a:
- Market-sharing cartel.
 - Centralized cartel.
 - Price leadership cartel.
 - Monopolistic cartel.
 - Predatory cartel.
17. In an oligopolistic market, a firm may decide to increase its scale so that it has excess production capacity because doing so enables it to
- Minimize its average cost of production.
 - Establish a credible deterrent to the entry of competing firms.
 - Broaden its product line.
 - Take fuller advantage of its dominant strategy.
 - Be ready for an expected expansion in overall demand.
18. A grocery store that offers to sell one can of soup for \$0.40 and three cans for \$1.00 is engaging in:
- First-degree price discrimination.
 - Second-degree price discrimination.
 - Third-degree price discrimination.
 - Joint-product pricing.
 - Multi-product pricing.
19. A firm charges \$14 for a product. If the mark-up is 40% then the fully-allocated average cost is:
- \$19.60.
 - \$14.00.
 - \$10.00.
 - Cannot be established without knowing the elasticity of demand.
 - None of the above is correct.
20. The optimal combination of joint products that are produced in variable proportions is found where:
- The marginal revenue from each product is equal to the marginal cost of each.
 - The isorevenue line is tangent to the transformation curve.
 - The isorevenue line is tangent to the relevant cost curve.
 - All of the above are correct.
 - Only a and b are correct.

II. **TRUE or FALSE (20 points total).** On your BLUEBOOK, label your answers to the following 10 statements with either a T or an F and briefly justify your answer. (Each answer is worth 2 points: 1 point for accuracy of answer and 1 point for the justification provided).

- If two goods are very close complements, then the cross-price elasticity of demand between the two goods will be large and positive.
- The adjusted coefficient of determination is larger than the unadjusted coefficient of determination.

3. **Seasonal Variation** is caused by expansions and contractions in overall economic activity.
4. If two "**Isocost**" lines are parallel, then both denote the same ratio of input prices but the line closer to the origin represents a higher level of total cost of inputs.
5. The **Survival Technique** is used to estimate short-run total variable cost functions.
6. If more firms enter a perfectly competitive industry, market equilibrium price will increase.
7. A **Nash Equilibrium** results when firms in an industry choose strategies that are mutually optimal.
8. The **Dominant-Firm price leadership** model describes a market structure in which the largest firm in the industry is the price maker and all other firms are price takers.
9. A firm that is engaging in **Third-Degree price discrimination** will charge a lower price to buyers with less elastic demands.
10. Under **Cost-Plus pricing**, the more elastic the demand is for a product, the higher should be the markup.

PROBLEMS – 60 points total for problems III, IV, V, and VI

- III. **15 points for correctly answering parts a, b, and c.** A firm produces two products (A and B) jointly. Every time a unit of A is produced, a unit of B is also produced as a by-product. The demand functions for A and B are: $Q_A = 3000 - 20 P_A$, and $Q_B = 1000 - 10 P_B$. Assuming that disposal of unneeded production is costless and the firm's marginal cost of producing a unit of joint output is: $MC = 70 + 0.30 Q$
- a. **For 4 points.** Determine the number of units of A and B that the firm should (i) produce, and (ii) sell.
 - b. **For 4 points.** Determine the selling prices for A and B.
 - c. **For 7 points.** Recalculate for both A and B the quantities that (i) should be produced, (ii) should be sold, and (iii) the respective selling prices on the assumption that relevant production cost structure is $MC = 10 + 0.10 Q$.
- IV. **15 points for correctly answering parts a, b, and c.** Best Product, Inc., is a monopolist. It has estimated the demand function for its product at:

$$Q = 60 - 0.4 P + 6 Y + 2 A$$

Where Q = quantity of units sold; P = price per unit; Y = per capita disposable income (in thousands); and A = advertising expenditures (in hundreds).

Best Product's average variable cost function is:

$$AVC = Q^2 - 10 Q + 60$$

Assuming $Y = 3$ (thousand) and $A = 3$ (hundred) for the period under consideration and that Total Fixed Costs = 1000:

- a. **For 6 points.** Derive the Marginal Cost and Marginal Revenue functions.
- b. **For 6 points.** Calculate the profit-maximizing price and output levels for Best Product. What would total profits be at the maximizing price/output combination? ~~Should total profit be calculated?~~
- c. **For 3 points.** If Total Fixed Costs were 1200, what would be the profit-maximizing price/output combination and what would total profits be?

V. **15 points for correctly answering parts a, b, and c.**

Mountainbrute Motorcycles, Inc., produces its very popular outdoor motorcycle at two separate plants. The production cost structures of the two are as follows: Plant A: $TC_A = 1,000 + 10 Q_A + 0.005 Q_A^2$, and Plant B: $TC_B = 1,500 + 4 Q_B + 0.015 Q_B^2$. Assuming that the market demand for the motorcycles sold by the firm is given by :

$$Q = 4,000 - 125P:$$

- a. **For 5 points.** Determine the optimum output and prices for the motorcycles produced by Mountainbrute Motorcycles.
- b. **For 5 points.** How many motorcycles should be produced at each plant in order to maximize profits?
- c. **For 5 points.** What would be the effect on profits if production was equally divided between the plants?

VI. **15 points for correctly answering parts a, b, and c.**

Optima Computers is organized along functional lines into a division that manufactures computer chips, and a division that uses such chips to assemble and sell PCs used in homes and businesses. Assuming that the cost structures are as follows: $TC_{\text{chips}} = 500,000 + 15Q_C + 0.0005Q_C^2$, and $TC_{\text{Assembly\&Sales}} = 300,000 + 10Q_{A\&S}$. Assuming further that the Assembly&Sales Division has the option of procuring the chips it needs on the open market at a price of 50/chip, and the market demand for Optima's computers has been estimated at: $Q = 100,000 - 1,000P$:

- a. **For 5 points.** Calculate Optima's best output and price for the finished product
- b. **For 5 points.** Calculate the price for chips that the Assembly&Sales Division should pay to the Chip Division.
- c. **For 5 points.** Calculate the best output of the Chips Division and the distribution of its sales within the firm and outside.