ECO 3033, Spring 2004 Exam 2, Sample Objective Questions

PART I. True/False

___ 1. The breakeven level of output of a firm occurs where gross profit contribution is zero.

___ 2. Normal profit is never considered to be an economic cost of production.

___ 3. The demand function for a firm relates how the quantities of a product or service that consumers would like to purchase during some specific period is influenced by variables such as the price of a firm's products, the prices of related goods, consumers' incomes, the season of the year, and dollars spent on advertising.

___ 4. A demand curve is a curve or line showing the relation between the quantity demanded per time period of a good or service and various possible prices of that good or service.

___ 5. A change in demand refers to the shift in a demand curve that occurs when the price of the item in question changes.

___ 6. Total revenue is the total dollar sales of a firm during some particular time period and is equal to the price of a product multiplied by the quantity sold.

___ 7. Average revenue is equal to the total revenue divided by marginal revenue.

___ 8. If an individual consumer purchases less of a good when his or her income increases, that good is said to be a normal good.

___ 9. Total profit will be maximized where total revenue is maximized.

___ 10. Marginal profit can be found by subtracting total cost from total revenue.

___ 11. Total profit will be maximized where marginal revenue equals marginal cost.

PART II. Multiple Choice

___ 1. Break-even analysis is:
   a. a more complex type analysis than profit maximization analysis.
   b. based on a linear TR and a linear TVC.
   c. always used in the long run analysis of firms because of its accuracy.
   d. the preferred method even when the firm knows its quantity demanded depends on price.
   e. never used by businesses today.

___ 2. Birdie heaven is a miniature golf course in Minneapolis. When winter comes, it is rational for the firm to temporarily shut down because:
   a. its fixed costs will rise dramatically.
   b. golf clubs break when they are cold.
   c. it will not be able to cover its variable costs.
   d. the cross elasticity of demand between golf and football is negative.
   e. its profit contribution will be positive, but not sufficient.
3. If all units of a product are sold at the same price, then the firm's total revenue divided by the quantity sold is:
   a. marginal revenue.  
   b. the firm's demand curve.  
   c. the product's price.  
   d. price elasticity of demand.  
   e. total average revenue.

4. If the quantity demanded does not change with respect to price, then:
   a. the demand curve is infinitely elastic.  
   b. the demand curve is unitary elastic.  
   c. the demand curve is completely inelastic.  
   d. the demand curve is in its inelastic range.  
   e. the demand curve is in its elastic range.

5. If the absolute value of the price elasticity of demand is less than 1, then:
   a. an increase in price decreases total revenue.  
   b. an increase in price has no affect on total revenue.  
   c. a decrease in price lowers total revenue.  
   d. a decrease in price raises total revenue.  
   e. a change in price has no affect on total revenue.

6. Marginal profit is:
   a. the rate of change of total profit with respect to changes in the level of output.  
   b. the average profit per unit sold.  
   c. is equal to total profit divided by quantity of output.  
   d. will be maximized where marginal revenue equals marginal cost.  
   e. the price of a product less the firm's average variable costs.

7. Assuming price is greater than average variable cost in the short-run and that at higher output levels marginal revenue is less that marginal cost, the firm will maximize profit if:
   a. marginal revenue is maximized.  
   b. marginal cost is minimized.  
   c. marginal profit is maximized.  
   d. marginal revenue is equal to marginal cost.  
   e. total revenue is equal to total cost.

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Answer Section

TRUE/FALSE
1. F  
2. F  
3. T  
4. T  
5. F  
6. T  
7. F  
8. F  
9. F  
10. F  
11. T

MULTIPLE CHOICE
1. B  
2. C  
3. C  
4. C  
5. C  
6. A  
7. D
Problem A.

The Demand function for product X has the following equation:

$$Q_X = 1592 - 20P_X - 10P_Y + .02I + .04A,$$

where

- $Q_X =$ number of units of X sold per week
- $P_X =$ the price charged per unit of X
- $P_Y =$ the price charged for a related good, Y
- $I =$ per capita income in the market area
- $A =$ the amount spent per week on advertising.

Suppose the firm spends $1,200 per week on advertising, that $P_Y$ is $40, and that income in the market area is $8,000 per capita.

1. In the space below, write the equation of the demand curve for product X.

$$Q_X = 1400 - 20P_X$$

2. Briefly explain how product X is related to product Y, given the equation for the demand function. (Is Y a substitute or a complement, and how can you tell?)

Complement. If $P_Y$ increases, people buy less $X$. That must happen because they buy less $Y$ and $X$ is used with it.

3. Given the values of the other independent variables stated above, calculate the point price elasticity of demand for X at $P_X = 50$. ($Q_X = 400$)

$$
\epsilon = -20 \cdot \frac{50}{400} = -2.5
$$

4. Given the values of $P_X$, $I$, and $A$ stated above, at what price and quantity demanded will total revenue from sales of X be maximized? How much will the maximum revenue be?

From 1, $R_X = 70 - .05Q_X$; $MR_X = 70 - .1Q_X$

$MR_X = 0$ at $Q_X = 700 \Rightarrow P_X = 35$

$MAX TR = 35 \cdot 700 = 24,500$
Problem C.

Tryfore Corp. is one of a small number of subcontract manufacturers of high-tech golf clubs. Its customers are sporting goods companies that distribute and market clubs under their own brand names. Last quarter, Tryfore sold 80,000 Supertech putters at a price of $42 per putter. This was a decrease in quantity sold of 10,000 in comparison with the previous quarter. Tryfore charged the same price to its customers during both quarters. However, during the most recent of those two quarters, one of its major competitors, McDivott Co., charged $38 for similar contract putters, a decrease in price of $6.00 from what it had charged during several previous quarters.

(a) What is the arc cross elasticity of demand of Tryfore putters for changes in the price of McDivott putters?

$$E = \frac{-10,000}{-6} \cdot \frac{82}{170,000} = +.80$$

(b) What was the dollar impact on Tryfore's total sales revenue when McDivott cut its price?

$$42(10,000) = -420,000$$

(c) Suppose the own price elasticity of demand for the Tryfore putters is -1.80, and that the management of Tryfore wishes to attain the same sales quantity per quarter that it had prior to the price cut by McDivott. Assuming that McDivott keeps its price at $38, what price would you recommend for Tryfore?

$$\frac{-1.8}{1} = \frac{10,000}{P_2 - 42} \cdot \frac{P_2 + 42}{170,000}$$

$$P_2 + 42 = -30.4 \cdot P_2 + 1285.20$$

$$31.4 \cdot P_2 = 1243.20 \quad P_2 = 39.34$$
Problem D.

Sniper, a company that makes radar detectors, has the revenue and cost data given in the table below.

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<th>Q</th>
<th>P</th>
<th>TR</th>
<th>MR</th>
<th>MC</th>
<th>MT</th>
<th>TVC</th>
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<td>95</td>
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<td>20</td>
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</table>

a. Complete the table.

b. What is the profit-maximizing price? \( 100 \)  
Quantity? \( 300 \)  
WHY?  
For greater \( Q \), \( MC > MR \).

c. How much is the total profit?  
\[
\Pi = 30,000 - 12,300 - 12,000 = 5,700
\]