

**Eastern University, Sri Lanka**  
**Faculty of Commerce and Management**  
**Fourth Year First Semester Examination in B.Com -2004/2005 (July 2007)**  
**ECN 4063 Managerial Economics**

Answer all questions

Time : Three hours

1. (i) Define price elasticity of demand .How is Price elasticity related to total revenue for a firm?

(3 Marks)

- (ii) **Smooth Sailing** Company has estimated the demand function for its sailboats (quantity purchased annually) as follows:

$$Q_s = 89,830 - 40P_s + 20P_x + 15P_y + 2I + 0.001A + 10W$$

Where

$Q_s$  = quantity purchased

$P_s$  = the price of Smooth Sailing sailboats

$P_x$  = the price of company x's sailboat

$P_y$  = the price of company y's motorboat

$I$  = per capita income in rupees

$A$  = amount spent on advertising , and

$W$  = number of favorable days of weather in the region

- (a) Identify the dependent and independent variables in the function, and interpret them

(4 Marks)

- (b) Suppose that  $P_s = 9000$  / = ,  $P_x = 9500$  / = ,  $P_y = 10000$  / = ,  $I = 15000$  / = ,  $A = 170000$  / = ,  $W = 160$  ; Find the price elasticity of demand at that point

(6 Marks)

- (c) Is price elasticity( $E_p$ ) elastic , inelastic ,or unitary elastic in part (b) why?

(3 Marks)

- (d) What information does your answer give to Smooth Sailing Company at the point given in part (b) .Are the boats a normal good or an inferior good? Why?

(4 Marks)

(Total 20 Marks)

2. Suppose a firm uses inputs of labor  $L$  and Capital  $K$  to produce its output,  $Q$ , according to the production function  $Q = 10 L^{1/4} K^{1/4}$ . Labor is paid an hourly wage rate of Rs. 25 and the rental price of capital is Rs 6.25. The firm decides to sell its output at the price of Rs. 10.

(i) Using appropriate Lagrange method, find the optimum level of the labor and capital

(8 Marks)

(ii) Calculate the profit level at this stage

(4 Marks)

(iii) Suppose due to the inflation the price of output increases by Rs. 1, calculate the new profit level

(5 Marks)

(iv) How does this price change make effect on labor and capital level?

(3 Marks)

(Total 20 Marks)

3. (i) Total profit function of SAMSUNG company which produces MP3 Players( $P$ ) and Mobile Phones( $M$ ), is given as follows :

$$T \pi = 52P - 0.06P^2 + 70M - 0.1M^2 + 0.01PM - 8000$$

(a) What combination of the two types of output will maximize the company's profit?

(5 Marks)

(b) How much will SAMSUNG company maximum monthly profit be?

(2 Marks)

(ii)

(a) What is monopoly power? How elasticity of demand determine the monopoly of a firm?

(4 Marks)

(b) A development department in Batticaloa has opened a new housing tract just outside the town. A private company come to agreement to supply drinking water and figures that, based on average home size, the demand for water is expressed in the following equation :

$$Q_w = 80,000 - 2000P_w$$

Where  $Q_w$  is the number of thousands of gallons of water consumed per month and  $P_w$  is the price per 1000 gallons. If marginal cost of producing the water is constant at Rs. 5 per 1000 gallons,

(i) What price should the company charge for the water?

(6 Marks)

(ii) If the average home consumes 10000 gallons per month, what will be the household's water bill?

(3 Marks)

(Total 20 Marks)

4. An electronic motor company is considering to modernize its plant facilities. Its current plant capacity is 1 million motors per year. Total variable costs associated with this plant are Rs.10,000,000, and fixed costs are 1 million rupees. The current capacity number of motors can be sold for Rs.20 each. The company is expanding and modernizing its plant facilities so that the current capacity will be doubled. Under this proposal, unit variable costs would be expected to decrease to Rs.5, and fixed costs would be expected to increase to 2 million. The firm estimates that it could sell 1.5 million motors at a price of Rs.15 each

- (i) Find the present break even quantity of the company (8 Marks)
  - (ii) What is the present profit level of the company (4 Marks)
  - (iii) Would you suggest that proposed plant would give more profit for the company? show your work? (8 Marks)
- (Total 20 Marks)

5. **Holiday On Wheels (HOW)** manufactures two types of recreational vehicles. One is a trailer that is towed behind a car or pickup, and the other is a motorized vehicle that moves under its own power. HOW is trying to determine the optimal combination of trailers and motor homes to produce per day, given that three of the inputs (power train assembly, paint and trim line, body assembly) needed to produce these products are available in limited amounts. Manufacture of one motor home requires 2 hours of power train assembly capacity, 2.5 hours of paint and trim capacity, and 3 hours of body assembly capacity, whereas the production of one trailer requires only 2 hours of paint and trim capacity and 2 hours of body assembly capacity.

HOW has available on a daily basis 300 hours of power train assembly capacity, 500 hours of paint and trim capacity, and 540 hours of body assembly capacity. The profit contribution of a motor home is Rs.4000, while that of a trailer is Rs.3000

- (a) Using graphical solution methods, find the profit maximizing combination of motor homes and travel trailers that HOW should produce daily. (12 Marks)
  - (b) What is HOW's daily contribution to profit at the optimal point? (4 Marks)
  - (c) Interpret slack variables in this solution (4 Marks)
- (Total 20 Marks)

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