Uva Wellassa University

Faculty of Management

Degree of Bachelor of Business Management in Entrepreneurship and Management

Degree of Bachelor of Hospitality, Tourism and Event Management

2nd YEAR 1st SEMESTER EXAMINATION –FEBRUARY-MARCH 2011

EMG 243-2 Business Mathematics

HTE 281-2 Business Mathematics

Part B – Essay Questions

Answer only three questions including the first question.

01) Demand function and total cost function of particular firm are given as follows.

$$P = 1400 - 7.5Q$$
$$TC = Q^3 - 6Q^2 + 140Q + 750$$

i) Find the level of output which maximizes the profit of this firm.

ii) Determine the price of above output.

iii) Calculate the maximum profit of this firm.

Above firm decided to introduce a new product. Now they have two products called X and Y. Their demand functions and joined cost function are given as follows.

$$P_x = 74 - 1.5Q_x$$
$$P_y = 72 - 2Q_y$$
$$TC = Q_x^{\,2} + 2Q_xQ_y + Q_y^{\,2} + 120$$

iv) Find the total revenue functions for good X & Y Separately.

v) Find the joint total revenue function (TR).

Vi) Find the joint profit function for above firm.

Vii) Find the X and Y output level which maximize the profit of the firm.

Viii) Find maximum profit of this firm.

(2.5 marks each)

02) The utility function of a consumer is given as follows.

$$U = X^{0.6}Y^{0.25}$$

Prices of two goods (X and Y) and income of the consumer are given as follows.

Price of "X": Px = 8
Price of "Y": Py = 5
Income I = 680

i) Find the level of "X" and "Y" which can be used to maximize the utility.

ii) Find the maximum utility at the optimum level.

iii) What happened to the above calculated consumption bundle, if the price of "X" decreases up to Px = 6?

iv) Find the new utility level and the value of Lagrangian Multiplier?

(5 marks each)

03)

i) Marginal revenue function is given by $MR = 60 - 2Q - 2Q^2$, Find the Total Revenue (TR) function and demand function.

ii) Find the demand function and average revenue (AR) function by using above total revenue (TR) function.

iii) Demand function and Marginal cost function of a profit maximizing monopolist is given as follows.

$P = 274 - Q^2$
$MC = 4 + 3Q$

Find the profit maximizing output and price of this firm.

iv) Find the consumer surplus for above (iii) situation.

(5 marks each)

04)

i) Sketch following two curves in the same graph.

$f(x) = -x^2 + 4x + 4$

$g(x) = x^2 - 4x + 4$

ii) Find the area between two curves.

iii) Marginal propensity to consume is given by $MPC = 0.5 + \left(\frac{0.1}{\sqrt{Y}}\right)$. When income is zero, consumption is equal 45. Find the consumption function.

iv) Find the level of consumption when income is equal to 100.

(5 marks each)