



University of Ruhuna

Faculty of Humanities and Social Sciences – Department of Economics

Master of Arts in Economics

First Semester End Examinations – March 2023

MAE5100 – Microeconomic Theory

Answer only (04) questions

*Three*  
~~Two~~ Hours (02)

01.

a) Following is the market observed data for good 'X'.

Price of 'X' (Rs.)	Demand of 'X' (Kg)	Supply of 'X' (Kg)
07	339	04
05	345	00

- I. Estimate the demand and the supply equations (assuming linear) for good 'X'.  
(2 Marks)
- II. Calculate the equilibrium price and equilibrium quantity of good 'X'.  
(2 Marks)
- III. Calculate the elasticity of demand and elasticity of supply of commodity 'X' at the equilibrium price.  
(2 Marks)
- IV. If the government imposed a tax of Rs 12.00 per unit on this product, calculate the new equilibrium price and equilibrium quantity after the tax.  
(2 Marks)
- V. Calculate the percentage of this tax that the customer pays.  
(2 Marks)
- VI. Calculate the welfare loss to the economy due to the tax.  
(1 Mark)

VII. If the government gives a subsidy of Rs.08.00 on this product instead of a tax, calculate the new equilibrium price and equilibrium quantity after the subsidy.

(2 Marks)

VIII. Calculate the welfare loss to the economy due to the subsidy.

(2 Marks)

02.

I. Explain what a production function is.

(2 Marks)

II. Explain the difference between a short-run production function and a long-run production function.

(2 Marks)

III. Explain what a map of isoquant curves is?

(2 Marks)

IV. Consider the following Cobb-Douglas production function.

$$Q = 16L^{0.4}K^{0.6}$$

where:  $P_L = Rs: 15.00$     $P_K = Rs: 20.00$

a) Derive the marginal product function of labour.

(1 Mark)

b) Derive the marginal product function of capital.

(1 Mark)

c) Derive the average product function of labour

(1 Mark)

d) Derive the average product function of capital.

(1 Mark)

e) Derive the function of the expansion path.

(2 Marks)

f) Is the firm producing using 60 units of labor and 50 units of capital an efficient combination of inputs?

(1 Mark)

g) Obtain the economies of scale.

(2 Marks)

03.

I. What is a perfectly competitive market?

(2 Marks)

II. The demand curve of a perfectly competitive firm and the demand curve of a monopoly firm are not the same. Prove the above statement by presenting the shape of the demand curves of those markets with the related reasons.

(3 Marks)

III. A perfectly competitive firm can continue to produce even if it incurs losses in a short period of time. Do you agree with the above statement? Justify by giving reasons.

(2 Marks)

IV. A firm producing product X operates in a perfectly competitive market. The firm's short-run total costs function is

$$TC = \frac{Q^2}{4} + 3Q + 400$$

$$\frac{d}{dQ} AC = 0$$

Show that marginal cost and average cost are equal.

(4 Marks)

V. A manufacturer can sell a certain product for Rs.10/= per unit. Total cost is

$$TC = Q^2 + 4Q + 2.$$

a) Calculate the firm's profit-maximizing output.

(2 Marks)

b) Calculate the firm's maximum profit.

(1 Mark)

c) Calculate average revenue and average cost at the firm's profit maximizing point.

(1 Mark)

04.

I. What is a monopoly market? (2 Marks)

II. When a monopolist sells a product by charging different prices in two markets, i.e. price discrimination. The demand function in market A is

$$P_A = 150 - 2Q_A \text{ and}$$

The demand function in market B is

$$P_B = 142 - 2Q_B.$$

Here  $Q_A$  and  $Q_B$  are the quantities sold per week in markets A and B, and  $P_A$  and  $P_B$  are the respective unit prices of the goods.

The monopolist's total cost function

$$TC = 600 + 6Q.$$

Where:  $Q = Q_A + Q_B$ .

a) How much should be sold in each market to maximize profit? (3 Marks)

b) What selling prices will give this maximum profit? (2 Marks)

c) What price will the monopolist charge to maximize profit without price discrimination? (3 Marks)

d) Compare the profit difference with price discrimination and without price discrimination. (2 Marks)

III. A firm producing product X operates in a perfectly competitive market. The firm's short-run total costs is

$$TC = \frac{1}{2}Q^3 - 5Q^2 + 28Q + 10$$

Determine at what price the firm should stop production in the short run.

(3 Marks)

05.

I. Name four main properties of a map of indifference curve. (4 Marks)

II. Explain the substitution effect and the income effect of a rise in the price of petrol using the necessary diagrams.



(6 Marks)

III. "A positively sloped labor supply curve arises because leisure becomes costly relative to consumption at a higher wage". Do you agree with this statement? Explain your answer.

(5 Marks)

6.

I. What is equilibrium of dominant strategies?

(4 Marks)

II. How do you explain the existence of a Nash Equilibrium?

(4 Marks)

III. "The logic of self-interest leads the participants in the game to a non-cooperative outcome that is worse for each individual". Based on your knowledge of the prisoner's dilemma, explain your answer.

(7 Marks)

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