

University of Ruhuna

Master of Arts in Economics - Academic Year 2019/2020

1<sup>st</sup> Semester End Examination – September 2020

MAE 5100 - Microeconomic Theory

This paper contains two parts.

Answer **four (04)** Questions selecting **two (02)** questions from each Part.

Use of calculators are allowed.

**Time: 03 Hours**

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Part - I

- (1) Suppose there is a perfectly competitive industry where all the firms are identical with identical cost curves. Furthermore, assume that a representative firm's total cost is given by the equation

$$TC = 100 + q^2 + q$$

where,  $q$  is the quantity of output produced by the firm. The market demand and supply of this product are given by the following equations.

$$P = 1000 - 2Q$$

$$P = 100 + Q$$

- (i) What is the equilibrium quantity and price in this market given this information? (2 Marks)
- (ii) Graph the Average Fixed Cost (AFC) curve for the range  $1 \leq q \leq 10$  (2 Marks)
- (iii) What is the firm's profit maximizing level of production and the total profit at this market equilibrium? (4 Marks)
- (iv) Given your answer in part (iii), what do you anticipate will happen in this market in the long-run? (2 Marks)
- (v) In this market, what is the long-run equilibrium price and what is the long-run equilibrium quantity for a representative firm to produce? What is the total quantity being sold in the market? (5 Marks)

(2) Imagine a monopolistic supplier producing in one firm at total cost  $TC = 2,000 + 20(Q_1 + Q_2)$  and selling in two distinct markets of which the demand equations are as follows.

Colombo Market  $Q_1 = 100 - p_1$

Galle Market  $Q_2 = 120 - 0.5p_2$

- (i) To maximize profit, decide how many units to be sold in each market (06 marks)
- (ii) Compute the price to be charged in each market (02 marks)
- (iii) Calculate the total profit (02 Marks)
- (iv) What will happen to the total profit if the monopolists wanted to shift one unit from the low priced market to the high priced market? (02 Marks)
- (v) What are the conditions to be satisfied for the price discrimination to be successful? (03 Marks)

(3)

- (i) Using hypothetical numbers and appropriate graphs, show that the equilibrium level of employment by a single firm operating in a perfectly competitive good market depends on
  - (a) Nominal wage
  - (b) Productivity of labour
  - (c) Price of the product resulted from labor

(06 Marks)
- (ii) If the firm invests more on fixed factors, when the market price of the product increases, graphically show the possible changes on the labour demand curve of the firm.
 

(04 Marks)
- (iii) The most part of the earnings of an international cricketer consists of "economic rent" whereas the most part of the earnings of a lawnmower operator (grass cutter) in such an international stadium consists of "transfer payments". Explain this statement.
 

(05 Marks)

## Part - II

- (04) Kalum's net income is Rs. 24,000 per month. He spends his total net income to buy good X and good Y to obtain a maximum utility. He is indifferent in terms of any XY combinations that give him the same utility. However, he is preferred higher indifference curves to lower ones and is willing to give up more goods from Y for a good X if he has few X than if he has many.

Price of good Y = Rs. 100

Price of good X = Rs. 400

- I. What is the condition required to maximize Kalum's utility? (01 mark)
- II. If 120 units is consumed from good Y at the optimum identified in (I), calculate the number of units consumed from good X at this optimum. (02 marks)
- III. Draw an indifference curve to show Kalum's choices that maximize his satisfaction given his budget constraint. (03 marks)
- IV. Suppose that Kalum's net income rises by 10 percent. Using the indifference curve analysis, show how Kalum reacts to this income increase for the following two cases.
- X and Y are 'normal' goods
  - Y is an inferior good
- (04 marks)
- V. Assume that the price of good X falls to Rs. 200. Analyze the impact of this price change on Kalum's choice. (05 marks)
- (05) A micro economist wants to model the computer industry with IBM playing the role of a stackelberg leader' and the other firms in the industry being stackelberg followers. According to the Stackelberg's model, the output that the leader (Firm L) chooses to maximize its profits depends on how the leader thinks the follower (Firm F) will react to its choices.
- The following facts are also given to the micro economist:
- Inverse market demand curve:  $P = a - bQ = 150 - 0.5 Q$  where  $Q = q_L + q_F$
  - Both Firms have zero marginal cost:  $MC_L = MC_F = 0$
- I. Show Firm F's problem and its reaction function. (03 marks)
- II. Show Firm L's problem and its profit function. (04 marks)
- III. Obtain stackelberg equilibrium quantities for Firm L and Firm F. (04 marks)
- IV. Do you agree with the fact that Firm L's (or IBM's) decision to announce output first is to have a strategic advantage? Give reasons. (04 marks)



06. (a) Suppose that you work as the principle research officer for ABC company that produces good X. The chief executive officer (CEO) of the ABC Company is planning to increase the price of good X due to the increased cost associated with the production process. However, the good X has a competing product good Y in the market. Therefore, the CEO requests you to conduct a research on the demand for good X to make policy implications on its new approach.

Assume that the representative consumer generates its utility from the following Cobb-Douglas utility function (U).

$$U(X, Y) = X^\alpha Y^\beta$$

- I. Using the theory of consumer choice, derive Marshallian demand function for good X and good Y. Use relevant assumptions where necessary. (05 marks)
- II. Can you practically estimate Marshallian demand function for good X in (I)? Briefly describe. (02 marks)
- III. What is the main limitation of using Cobb-Douglas utility function? (03 marks)

- (b) "Theoretically, Firms in the oligopoly have the potential to earn monopoly profits if they work together. But each oligopolist has an incentive to cheat."

Using the payoff matrix given below regarding an agreement between two major oil producing countries (i.e. Iran and Iraq) in the world, analyze why oligopolies cannot practically maintain monopoly profits.

		Iraq	
		Produce more than quota of output of the original agreement	Stick to the original agreement
Iran	Produce more than quota of output of the original agreement	\$ 40 bn, \$ 40 bn	\$ 60 bn, \$ 30 bn
	Stick to the original agreement	\$ 30 bn, \$ 60 bn	\$ 50 bn, \$ 50 bn

(05 marks)

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