



**DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY
UNIVERSITY EXAMINATION 2014/2015**

**FIRST YEAR EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN
ECONOMICS**

BEC 4100: MICROECONOMIC THEORY

DATE: 19TH APRIL, 2015

TIME: 9.00AM – 12.00 NOON

Instructions:

Answer Question ONE and any other THREE QUESTIONS

Question ONE carries 40 marks. Other questions carry 20 marks each

Write your registration number clearly, show your workings where vital, be neat and to the point

QUESTION ONE

- a) Using diagrams, distinguish between;
- Demand for perfect substitutes and that of perfect complements (4 marks)
 - Engel curves and price consumption curves (4 marks)
- b) Show a budget line expression and with the aid of a diagram ,use it to explain the effect of the following on the consumers budget line;
- Price P1 and P2 rises by the same proportion (2 marks)
 - Government imposes ad-valorem tax on good X (2 marks)
- c) A consumer derives utility from two commodities X and Y. His utility function is given by $U(X,Y) = XY$. He has a budget of Ksh. 1600. The price of commodity X is 40 and the price of commodity Y is 80. Derive the optimal quantity of each good that this consumer can consume and calculate maximum utility (9 marks)
- d) Assume a demand function for good X of the form $X = 20 + \frac{M}{20P_1}$. Suppose initially the price of X, $P_1=6$; and the consumer's money income $M=240$. Suppose the price of X falls to $P_1=5$. Compute the substitution effect and income effect of the price change (8 marks)
- e) Consider production function $Q = 5L^{0.5}K^{0.3}$. Does it represent increasing, decreasing or constant returns to scale (5 marks)
- f) A firm reports that marginal product of labor is 5 and marginal rate of technical substitution of labor for capital is 2. What is the marginal product of capital? (3 marks)
- g) Explain the sources of oligopoly (3 marks)

QUESTION TWO

- a) By use of a relevant diagram, explain what is meant by revealed preference theory (5marks)
- b) Suppose a discriminating monopolist is selling a product in two separate markets in which demand functions are

$$P_1 = 12 - Q_1$$

$$P_2 = 20 - Q_2$$

The monopolist's total cost function is $TC = 3 + 2Q$

As an economic adviser you are asked to determine the prices to be charged in the two markets and amount of output to be sold in each market so that profits are maximized. You are also asked to calculate the total profits to be made from the strategy of price discrimination. What advise will you give? (15 marks)

QUESTION THREE

- a) Who is a consumer (1 mark?)
- b) Using utility theory, state the condition for consumer equilibrium and derive the consumers demand curve (7 marks)
- c) In a city there are a large number of firms selling a product and no single firm has any control over the price of the product. The following total revenue and cost functions are given for a single seller

$$TR = 10Q$$

$$TC = 1000 + 2Q + 0.01Q^2$$

- i) Determine how many units of the product a firm will produce per annum if it aims at profit maximization (5 marks)
- ii) Find out the total profits made by the firm in the equilibrium situation (5 marks)
- d) Explain the conditions of long run equilibrium of a firm operating under conditions of perfect competition (2 marks)

QUESTION FOUR

- a) Define welfare economics and critically explain the criteria for social welfare (10 marks)
- b) You are given the following production functions. What types of production function are they?

(i) $Q = 2L + K$ (2 marks)

(ii) $Q = \min(2L, K)$ (2 marks)

- c) The production function for a firm's commodity is represented as follows

$$Q = 20K^{1/2}L^{1/2}$$

Where Q =Output; K =Capital; and L =Labour.

Suppose the quantity of capital is fixed at 100. If the wage rate is \$20 and price of output is \$ 2 per unit. Determine the optimal use of labour input. (6 Marks)

QUESTION FIVE

- a) What is monopoly? Explain the three conditions necessary for the existence of monopoly (6 marks)
- b) The following demand function and total cost function of a monopolist are given.

Price (Kshs)	Quantity sold	Total cost(Kshs)
15	1	12
14	2	22
13	3	31
12	4	39
11	5	46
10	6	54
9	7	64
8	8	75

- i) Calculate his marginal revenue and marginal cost (8 marks)
- ii) At what level of output will the monopolist be in equilibrium (2 marks)
- iii) What price will be set at the equilibrium output (2 marks)
- iv) Calculate the total profits made by him (2 marks)