



**DEDAN KIMATHI UNIVERSITY OF TECHNOLOGY**  
**UNIVERSITY EXAMINATION ACADEMIC YEAR 2014/2015**  
**FIRST YEAR EXAMINATION FOR THE MASTERS OF SCIENCE IN ECONOMICS**

**BEC 4100: MICROECONOMIC THEORY I**

**DATE: 13<sup>TH</sup> DECEMBER 2014**

**TIME: 10.00AM-1.00PM**

**Instructions:**

**Answer question ONE and any other TWO questions**

**QUESTION ONE**

Instructions: Attempt Question 1 and any other three questions

**SECTION A**

1. With clear explanations, graphically or otherwise demonstrate the following:
  - a) Given a demand function of the form  $Q_1 = aP_1^b$ ,  $a > 0$ ,  $b < 0$ , the elasticity is simply  $b$ .  
Where  $Q_1$  = quantity demanded of good 1,  $P_1$  is the unit price of good 1. (5 mks)
  - b) That price consumption curve is not the same as income expansion path. (5 mks)
  - c) That in a pure economy, with two commodities, for instance, meat and flour, only points on the contract curve are pareto-efficient. **Hint:** pick two point on the contract curve and two points off the curve. (5mks)
  - d) The distinction between Slutsky and Hicksian compensation. (5 mks)
  - e) Consumer equilibrium occurs where the Marginal Rate of Substitution (good  $X_2$  for good  $X_1$ ) between consumers is equal to the inverse price ratio,  $P_1/P_2$ . (5mks)
  - f) Assume that a household faces a utility function of the form  $U = U(X_1, X_2) = 5 \ln X_1 + 3 \ln X_2$ , and that it faces a per-unit price for food ( $X_1$ )  $P_1 = \$10$  and clothing( $X_2$ )  $P_2 = \$2$  with a given income  $M = \$96$ . Using the Lagrangian multiplier method, show the optimal consumption of the two goods. (5mks)

**SECTION B**

2. A multiplant monopolist faces a demand curve of the form  $Q = 200 - 2P$ , where  $Q$  is output and  $P$  is price of the product. The costs of the plants are  $C_1 = 10Q_1$  and  $C_2 = 0.25Q_2^2$  where  $C_i$  is unit cost of production for each plant.
  - a) With examples from Kenya, examine the basis for existence of monopolies. (3 mks)
  - b) Determine the total output, output for each plant, and the maximized profit. (5mks)

- c) Why should costs differ between plants 1 and 2? (2mks)
3. The voice telecommunications sub-sector in Kenya is dominated by two firms, Safaricom and Airtel Kenya Ltd.
- a) Discuss implications of collusive and non-collusive engagement of these two firms on consumer welfare and industry profit. (3mks)
- b) Assume that in a duopoly market demand function is  $P = 100 - 0.5(X_1 + X_2)$  and the duopolists costs are  $C_2 = 0.5 X_2^2$  for firm A and  $C_1 = 5 X_1$  for firm B. Assuming firm A is the leader, what is the Stackelberg solution  $X_1$  and  $X_2$ . What is the profit for each firm? (7mks)
4. Mr. Khakhali's demand function for beef is given by  $X = 10 + MP^{-1}/10$  where X is quantity demanded of beef, M = income and P = price. Price per kilogram is KES 120. Monthly income = KES 2,400.
- a) Clearly distinguish between substitution and income effects. (3 mks)
- b) Showing all the relevant steps and formulae, compute the total effect, income effect and substitution effect if price of beef declines by KES 20 per kilogram. (7 mks)
5. Examine the following economic concepts
- a) Long-run equilibrium for a perfectly competitive market. (2mks)
- b) Classical production function and an isoquant. (2mks)
- c) Derivation of Engel curve and derivation of demand curve. (6mks)