MUEO

MOI UNIVERSITY

OFFICE OF THE DEPUTY VICE CHANCELLOR (A,R&E)

UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATIONS

FOR THE COMMON COURSES

COURSE CODE: ECO 210

COURSE TITLE:: INTERMEDIATE MICROECONOMICS

DATE: 17TH AUG, 2023   **TIME: 9.00 AM – 12.00 NOON**

INSTRUCTION TO CANDIDATES

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ECO 210: INTERMEDIATE MICROECONOMICS

Instruction to candidates: Answer Question ONE and ANY other THREE questions

Question One

a) Distinguish the following terms as used in microeconomics
   i.   Marginal Rate of Technical Substitution   (2 Marks)
   ii.   Substitution effect   (2 Marks)
   iii. Consumer equilibrium   (2 Marks)
   iv.   Conditional factor demand   (2 marks)
   v.   Returns to scale   (2 marks)

b) Using the following utility function, $U(x_1 x_2) = x_1^{0.5} x_2^{0.5}$ show that the parameters indicated are the elasticities with respect to the two goods consumed by an individual.(6 Marks)

c) Assume that the total demand is $X = 50 - 0.5P$ and that demand functions for the segmented markets are: $X_1 = 32 - 0.4P_1$ and $X_2 = 18 - 0.1P_2$. The cost function $C = 50 + 40X$ Where $(X = X_1 + X_2)$. Determine the discriminating price, TR and MR in the two submarkets as well as its total profits π.   (6 marks)

d) Assuming a case of two goods, use the Edgeworth box diagram to explain the condition for Pareto efficient allocation.   (4 marks)

Question Two

i.   A firm produces cellular telephone service using equipment and labour. When it uses E machine-hours of equipment and hires L person-hours of labor, it can provide up to Q units of telephone service. The relationship between Q, E, and L is as follows: $Q = \sqrt{EL}$. The firm must always pay P_E for each machine-hour of equipment it uses and P_L for each person-hour of labor it hires. Suppose the production manager is told to produce $Q = 200$ units of telephone service and that she wants to choose E and L to minimize costs while achieving that production target.

   a) What is the objective function for this problem?   (2 Marks)
   b) What is the constraint?   (2 Marks)
   c) Which of the variables (Q, E, L, P_E, and P_L) are exogenous? Which are endogenous? Explain.   (2 marks)
   d) Write a statement of the constrained optimization problem   (2 Marks)

ii.   A consumer has utility function $U = X_1^{0.6} X_2^{0.4}$. If the consumer's income is Ksh 500 and prices of the goods 1 and 2 are Ksh 10 and Ksh 5 respectively. Obtain the uncompensated demand functions for the consumer   (7 marks)

Question Three

a) Using appropriate microeconomic tools show that the slope of indifference curve is equivalent to the ratio of marginal utilities of the two goods under consideration
                                                                                       (6 Marks)
b) Given utility function U= $X_1^{0.5} X_2^{0.5}$. Calculate marginal rate of substitution for the two commodities   (4 marks)
c) Assuming that a consumer's consumption bundle is $(X_1 X_2)$ Show that the slope of budget line is the ration of prices of the two goods   (5 marks).

Question Four

a) A firm in perfectly competitive market produces and sells two goods Q_1 and Q_2 priced at KES 100 and 120 respectively. The firms total cost function is given as
$$TC = 3Q_1^2 + 3Q_1 Q_2 + 2Q_2^2 + 10$$

Required

   i. Find the total revenue function of the firm   (3 Marks)
  ii. Find the profit function of the firm,   (3 Marks)
 iii. Find the critical values of Q_1 and Q_2 for profit maximization   (5 Marks)
 iv. By applying the second order condition, verify that the critical values present the maximum profit   (4 Marks)

Question Five

a) A firm has the following production function Y = $X_1^{0.4} X_2^{0.6}$. Given the prices for inputs one (1) and two (2) are 16 and 12 respectively. Obtain the conditional factor demand functions.
                                                                                       (9 Marks)
b) Describe at least three types of production functions analyzed in economics
                                                                                       (6 Marks)

Question Six

a) A monopolist's demand function is given as $Q = 2000 - 10P$, where Q is the quantity is produced and sold and P is the price per unit in Ksh. If the firm's marginal costs are

$MC_1 = 10Q_1$ and $MC_2 = 0.25Q_2^2$ respectively. Calculate the monopolist's equilibrium quantities and price. (9 Marks)

b) Kenya Power and Lighting Company is a public corporation that practices third-degree price discrimination. Explain the enablers for the successful implementation of the pricing strategy (6 Marks)