



# THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

**A. M. E. C. E. A**

**MAIN EXAMINATION**

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**JANUARY – APRIL 2018 TRIMESTER**

**FACULTY OF ARTS AND SOCIAL SCIENCES**

**DEPARTMENT OF ECONOMICS**

**REGULAR PROGRAMME**

**ECN 201: PRINCIPLES OF MICROECONOMIC THEORY**

**CEC 211: INTERMEDIATE MICROECONOMIC THEORY**

**Date: APRIL 2018**

**Duration: 2 Hours**

**INSTRUCTIONS: Answer Question ONE and any other TWO Questions**

- Q1. a) Citing examples explain 3 basic properties of consumer preferences. **(6 Marks)**
- b) Given the following production  $\log Y = 0.46 \log X_1 + 0.55 \log X_2$
- i) Interpret the coefficients of the function. **(2 Marks)**
- ii) Show the returns to scale and degree of homogeneity **(3 Marks)**
- c) Use a well labeled diagram to demonstrate that monopolies are cost to the society **(4 marks)**
- d) Use Edge Worth diagram to analyze the exchange of good 1 and 2 and two inputs labor (L) and capital (K) **(5 Marks)**
- e) Explain the difference between the following terms
- i) Interior optimum solution and boundary optimum solution **(2 Marks)**
- ii) Conditional factor demands and profit maximization factor demands. **(2 Marks)**
- iii) Strong axiom of revealed preference and weak axiom of revealed preference. **(2 marks)**

- f) Implicit to the concept of marginal rate of technical substitution is the concept of marginal product. Using an isoquant whose output is a function of capital (K) and labor (L) and is given

$$\bar{y} = f(K, L) \text{ show that } MRTS = \frac{\Delta K}{\Delta L} = - \frac{MP_L}{MP_K} \quad (4 \text{ Marks})$$

- Q2. a) Suppose that a consumer has a demand function for good X of the form

$$X = 15 + \frac{Y}{12P}$$

Where Y is income level and P is the price level of X. let his original income be KES144 per day and let the price of good X be KES 3 per unit. Suppose the price of good X falls to KES 2 per unit .Assuming X1 is a normal good determine the slustkys income and substitution effects of a price change and use a well labeled diagram to show these effects

**(11Marks)**

- b) What type of commodities have their indifference curve with the following behavior of Marginal Rate of Substitution (MRS)

- i) MRS is everywhere infinite **(1 Mark)**
- ii) MRS is either zero or infinite or nothing between **(1 Mark)**
- iii) MRS is constant **(1 Mark)**
- iv) MRS is diminishing **(1 Mark)**

- c) With the aid of a well labeled diagrams and equations, demonstrate that a firm operating in the perfectly competitive industry will pay a nominal wage that is consistent with the value of the marginal product of the worker.

**(5 Marks)**

- Q3. a) A firm is producing output according to the following production function  $f(K, L) = K^\alpha L^\beta$ . given that the factor prices of K and L are r and w respectively. Find the unconstrained input demand functions and the total supply function for the firm **(10Marks)**

- b) Given a utility function  $U=XY+X+2Y+2$  and a budget constraint  $P_xX+P_yY=M$ , with  $P_x>0$ ,  $P_y>0$ , and  $M>0$ : and  $P_x$  is price of good X,  $P_y$  is price of good Y, and M is income;

- i) Find the optimal quantities of X, Y in terms of  $P_x$ ,  $P_y$ , and M. **(4 Marks)**

- ii) Find the / in terms of  $P_x$ ,  $P_y$ , and M, and provide its economic meaning. **(3Marks)**

- iii) Find the total utility  $U^*$  at the optimal choice. Make sure you express utility in terms of  $P_x$ ,  $P_y$ , and M. **(3 Marks)**

- Q4. a) Determine the equilibrium quantities of commodity X and Z for a consumer whose total utility U and other relevant variables is given as below **(6 Marks)**  
 $U = 20x - 4z^2 + 40z - x^2$ , income level  $Y = KES48$ , price of X  $P_x = KES 2$  and price of Z  $P_z = KES4$
- b) Under what conditions would price discrimination be effective for a monopolist **(5Marks)**
- c) A monopolist faces the following markets with the following demand functions  
 $x_1 = 100 - p_1$   
 $x_2 = 100 - 2p_2$   
 Assume the monopolists marginal cost is constant at Ksh.20 find the price that should be charged in each market in order to maximize profits if the monopolist  
 i) Can price discriminate **(5 Marks)**  
 ii) Cannot discriminate **(4 Marks)**
- Q5. a) Consider two consumers whose utility functions from two goods are given  
 $U_A(X_A^1, X_A^2)$  as;  
 and  $U_B(X_B^1, X_B^2)$   
 Where  $X_A^1$  and  $X_A^2$  represents to A's consumption of good 1 and 2 respectively while  $X_B^1$  and  $X_B^2$  represents B's consumption of good 1 and 2 respectively. Let  $W^1$  and  $W^2$  represent the availability of the two goods 1 and 2. Show graphically and mathematically that at a Pareto efficient allocation, the marginal rate of substitution between the two goods must be equal. **(10Marks)**
- b) Using microeconomic tools of analysis prove that the slope of indifference curve is the ratio of marginal utilities of the goods. **(5 Marks)**
- c) Use diagram and explanation to derive the choice of input and output level in the short run period of production for a firm which is after profit maximization **(5 Marks )**

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