## KENYATTA UNIVERSITY

## UNIVERSITY EXAMINATIONS 2016/2017

# FIRST SEMESTER EXAMINATIONS FOR THE DEGREE OF BACHELOR OF ECONOMICS

EET 300 : MICROECONOMIC THEORY III

DATE: MONDAY 21<sup>ST</sup> NOVEMBER 2016

TIME: 4.30 P.M. – 6.30 P.M.

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## INSTRUCTIONS

## ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

#### **Question one**

a) Clearly distinguish between the following pairs of concepts as used in microeconomic theory. Use relevant economic methodologies where necessary. (20marks)

- i) Production possibility set vs. Input requirement set
- ii) Hotelling's lemma vs. Shepherd's lemma
- iii) Compensated demand function vs. Conditional demand function
- iv) Duality in consumption vs. Duality in production
- v) Weak monotonicity vs. strong essentiality
- b) A murder has been committed in Nyeri town. The only clue is a grocery receipt left at the scene by the murderer. The receipt shows that 20 bags of crisps selling for Ksh. 200 a bag and 10 six- packs of beer selling at Ksh. 300 per six pack were bought that day. There are two suspects, Njoroge Notorious and Maina the swift. On searching their apartments, the National Security Intelligence Service found the suspect's grocery bills for the previous week. Last week, crisps were selling at Ksh. 300 a bag and beer Ksh. 500 per six pack. Njoroge bought 35 bags of crisps and 4 packs of beer at those prices while Maina bought 30 bags of crisps and 7 packs of beer. Assuming the criminals have well-behaved preferences, can you tell who is not the murderer? Explain (10marks)

## **Question** Two

- a) Each of the firms in an industry have a long- run cost function given as:  $TC = Q^3 - 12Q^2 + 60Q$  where Q is the output for each firm. The industry's market demand function is Q = 1440 - 10P where P is the price of output per unit.
  - i) Determine each firm's optimal level of output and hence the equilibrium price in the market. (3marks)
  - ii) What is optimal number of firms in this industry (2marks)
- b) In a duopoly market demand and costs of the two firms are:

P = 100 - 0.5X, where  $X = X_1 X_2$ 

 $C_1 = 5X_1 + 10$ 

 $C_2 = 0.5X_2^2 + 20$ 

- i) If firm 1 is a quantity leader, determine the equilibrium prices and quantities in the market. (5 marks)
- ii) Suppose firm 1 is a price leader, how would the answers in (1) above change? (5marks)
- iii) Suppose the two firms decided to form a cartel and maximize their joint profits, determine the equilibrium price, outputs and profit in the market. (5 marks)

## **Question Three**

- a) Given a cost equation and production function as  $C = 2x_1 + 8x_2$  and  $100 = x_1^{0.5} x_2^{0.5}$  respectively.
  - i) Determine the equilibrium levels of inputs 1 and 2. (8 marks)
  - ii) Do the equilibrium input levels in i. above minimize cost? Show your working. (12 marks)

## **Question Four**

Given the following indirect utility function:  $(P, M) = \frac{M}{\sqrt{P_1 P_2}}$ , where  $P_1$  and  $P_2$  are the prices of two goods  $X_1$  and  $X_2$  respectively and M is the consumer's income:

- i) Verify the properties of the following indirect utility function (5 marks)
- ii) Find the corresponding expenditure function (5 marks)
- iii) Using the above information, state and demonstrate the Slutsky's equation (10marks)

# **Question Five**

A maize farmer produces using two inputs labour (L) and fertilizer (K). the farmer's profit function is given by:  $\pi = \frac{P^2}{\sqrt{wr}}$ ,

Where P is the price of maize per bag and r and w are the unit prices of fertilizer and labor respectively. Fertilizer is measured in 1 kg bag, while labor is measured in Man hours.

- i) Is the above profit function legitimate? Show your working (10marks)
- ii) If maize sells at Ksh. 500 per bag, labor costs Ksh.100 per hour and fertilizer cost
  Ksh. 25 per 1 kg bag, determine the number of bags of maize that will maximize the farmer's profit. How much will this farmer spend on both labor and fertilizer?

(10marks)