

FIRST SEMESTER, 2016/2017 ACADEMIC YEARFOURTH YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE
IN ECONOMICS AND STATISTICSECO 410: ADVANCED MICROECONOMICS

TIME: 3 HRS

EXAMINATION SESSION: DECEMBER 2016YEAR: 2016INSTRUCTIONS

- (i) Answer question ONE and any Other Three questions
 (ii) Do not write on the question paper
 (iii) Show your working clearly

QUESTION ONE – 25 MARKS

Mr Nehemiah consumes goods K_1 and K_2 . He buys the goods at P_1 and P_2 per unit respectively.
 His income is Y per month.

His direct utility function is given below:

$$U(K_1, K_2) = 4K_1^2 K_2^2$$

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|------|---|-----------|
| i. | Explain the assumptions of consumer preferences | (5 marks) |
| ii. | Derive the indirect utility function. | (5 marks) |
| iii. | State the properties of indirect utility function. | (3 marks) |
| iv. | Derive the expenditure function of the consumer. | (3 marks) |
| v. | State the properties of the expenditure function. | (3 marks) |
| vi. | Using the indirect utility function above demonstrate Roy's Identity. | (3 marks) |
| vii. | Using the expenditure approach demonstrate Shephard Lemma. | (3 marks) |

QUESTION TWO – (15 MARKS)

a) The demand function of segmented markets facing a price discriminating monopolists are

$$X_1 = 320 - 4P_1$$

$$X_2 = 180 - P_2$$

Further assume that the cost function is $C = 500 + 400X$ where $X = X_1 + X_2$.

Required calculate

- | | | |
|----|----------------------------|-----------|
| i. | Output sold in each market | (3 marks) |
|----|----------------------------|-----------|

- ii. Price charged in each market (1 marks)
- iii. Price elasticity in each market (1 marks)
- iv. Profit of the monopolist (3 marks)
- a) Explain revealed preference theory of consumer demand, and comment on its validity (7 marks)

QUESTION THREE – (15 MARKS)

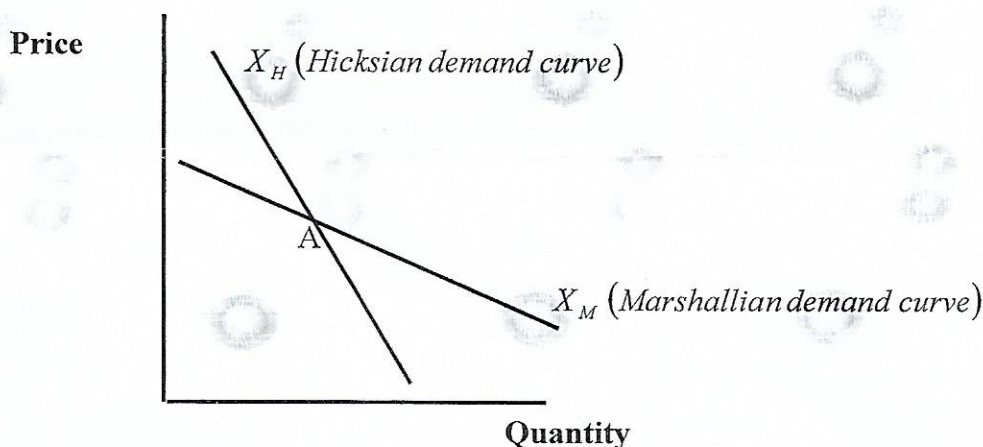
- a) A market is dominated by two large firms, A and B. Given that the market demand and cost function facing these firms are,

$$P = 101 - 0.5Q$$

$$C_A = 5Q_A$$

$$C_B = 0.5Q_B^2$$

- i. Find the firms reaction functions assuming both firms seek to maximize profit. (6 marks)
- ii. Calculate the maximum attainable profit for each firm. (3 marks)
- b) Given the intersection between the Hicksian and Marshallian demand functions



At point A, the income available for consumption will be equal to the minimum expenditure on the two goods i.e. the Hicksian and the Marshallian demand functions yield the same

results. Given that $x_H(p_i, u) = x_M(p_i, M)$ and $M = E(p_i, u)$
 $x_H(p_i, u) = x_M(p_i, E(p_i, u))$

Derive the Slutsky's equation. (6 Marks)

QUESTION FOUR – (15 MARKS)

- a) Given the production function below:

$$Q=345L^{0.5}K^{0.5}$$

Where Q- Unit of output, L- Unit of Labour, K- Unit of capital engaged. Assume further that the firm has a budget of Y and each unit of labour and capital are bought at w and r respectively.

- i. State the output maximization problem of the firm (2marks)
 - ii. Derive the conditional demand for L and K (3marks)
 - iii. Assume w=18 and r= 35 and Y= 12000. Find the actual amount s of L and K. (2 marks)
 - iv. Derive the cost function of the firm (2marks)
 - v. State the properties of the cost function (2marks)
 - vi. Confirm shepherd lemma. (1marks)
- b) Derive graphically the supply curve of the firm in a perfect market. (4marks)

QUESTION FIVE – (15 MARKS)

a) Kabianga Cunning company processes and supplies mango juice (Q) and sells at Kshs. P per litre. They use capital (K) and Labour in their production which is hired at a wage rate w and interest rate r per unit respectively. Its budget is Kshs. C. His production function is as given below:

$$Q= 180L^{0.5}K^{0.5}$$

- i. Derive the profit maximising demand function for Land K (3marks)
 - ii. Derive the output supply function for Q (2marks)
 - iii. Derive the firm's profit function (2marks)
 - iv. State the properties of the profit function (3marks)
- b) In a pure exchange economy with two people (A and B) and two goods (1 and 2), draw an Edgeworth Box and using indifference curves, show the endowment point and also the most preferred allocation for the two people. (5 Marks)
