CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE IN ECONOMICS

MSEC 811: ADVANCED MICROECONOMICS THEORY I

STREAMS: MSC (ECON) **TIME: 3 HOURS**

DAY/DATE: WEDNESDAY 14/07/2021 **02.30 P.M. – 5.30 P.M.**

INSTRUCTIONS:

- **Answer question one and any other three questions**

QUESTION ONE

(a) Explain clearly the concept of duality in production and cost function. (5 marks)

(b) Explain the properties of input demand and output supply functions. (10 marks)

(c) Given $Y = Ax^{\alpha}$ calculate the following, (10 marks)

(i) Unconditional input demand

(ii) Output supply

(iii) The profit function

(d) Find the associated production function of the following cost function.

$C(w,y) = (5w_1 + 3w_2)y$ (5 marks)

(e) Given a utility function

$U(x) = 7x_1 + 5x_2$

Required

(i) Calculate the Marshallian demands for this consumer (6 marks)

(ii) Derive the indirect utility function for this consumer. (4 marks)

(iii) Calculate the hicksian demands for this consumer. (6 marks)

(iv) Derive the expenditure function for this consumer. (4 marks)

QUESTION TWO

(a) Explain the properties of profit function (8 marks)

(b) Consider a consumer who consumes two commodities x_1 and x_2. Suppose the expenditure function for this consumer $E(p,u) = P_1^{½} P_2^{½} U$. Assume the initial situation is such that $P_1 = 1$, $P_2 = 1$, and $M = 100$. If government imposes a tax on the good x1 so that the new $P_1 = 4$. What amount of additional income would be needed to compensate the consumer so that he remains on the same of utility as before imposition of tax? (9 marks)

(c) Derive the condition for both maximum and minimum given a non-negativity constraint. (8 marks)

QUESTION THREE

Suppose the production function for given firm as follows

$Y = X_1^{0.2} X_2^{0.5}$

Required

Using the two step approach calculate the following

(i) Conditional input demands (5 marks)

(ii) The minimum cost (5 marks)

(iii) Output supply function (5 marks)

(iv) Unconditional input demands (5 marks)

(v) Maximum profits (5 marks)

QUESTION FOUR

(a) Consider a simple case of single output and single input. State, derive and clearly prove the 1st Hotelling's lemma. (15 marks)

(b) Explain the properties of cost function. (10 marks)

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