

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATION

RESIT/SUPPLEMENTARY / SPECIAL EXAMINATIONS EXAMINATION FOR THE
AWARD OF DEGREE OF MASTER OF SCIENCE IN ECONOMICS

MSEC 811: ADVANCED MICROECONOMICS THEORY I

STREAMS:

TIME: 3 HOURS

DAY/DATE: FRIDAY 07/05/2021

8.30 A.M - 11.30 A.M.

INSTRUCTION:

- Answer ALL questions

Question One

a) Distinguish between the following terms:

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| i) Hotelling's Lemma and Shepherd's Lemma | (2 marks) |
| ii) Unconditional and conditional input demand | (2 marks) |
| iii) Indirect utility and direct utility | (2 marks) |
| iv) Production function and output supply function | (2 marks) |
| v) Homogeneous function and homothetic function | (2 marks) |

b) Given $Y = Ax^\alpha$ calculate the following; unconditional input demand, output supply and the profit function (8 marks)

c) Suppose the cost function of a certain firm is given as $C = 20w_1^{0.2}w_2^{0.3}Y$ calculate the associated production function using the concept of duality (10 marks)

d) Consider a simple case of single output & single input. State, derive and clearly prove the Shepherd's lemma (12 marks)

Question Two

Given a utility function

$$U = X_1^{1/2} X_2^{1/2}$$

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)
- v) Prove the Slutsky's equation (10 marks)

Question Three

Suppose the firm's production function is given as $Y = x_1^{1/4} x_2^{1/2}$ use the two step approach to solve the following

- i) Conditional input demand functions (5 marks)
- ii) The minimum cost (3 marks)
- iii) Output supply function (3 marks)
- iv) Unconditional input demand functions (4 marks)
- v) Maximum profit (5 marks)

Question Four

Consider a maize farmer who lives near a factory. The farmer has two options of working either

- i) On the farm supplying L_1 hours
- ii) At the factory supplying L_2 hours

Assume that the amount of maize produced, y , is given by production function of the form $y = x^a$, that the farmer has at most L hours to work in either farm or factory, that the farmer's utility function for market consumption good, c , and maize consumption, x , is given by $u(c, x) = cx$, that the price of market goods is defined as \$ P_c , that the price of maize as \$ P_x , and the wage rate for working at the factory is w .

Required

- a) Set up the decision problem for the farmer (5 marks)
- b) What are the first order conditions and what do they mean? (5 marks)
- c) What is the equilibrium solution for L_1 , y , c , and x ? (5 marks)
- d) Suppose $a = \frac{1}{2}$, what happen if w changes? (5 marks)
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