CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

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

AGEC 801: MICROECONOMICS

STREAMS: BSC. AGEC **TIME: 3 HOURS**

DAY/DATE: FRIDAY 13/12/2024 **11.30 A.M. – 2.30 P.M.**

INSTRUCTIONS:

(i) Answer **ALL** questions in **Section A** and any other **TWO** questions.
(ii) Do not write on the question paper

SECTION A

QUESTION ONE

a. Consider the following indirect utility function, $V(p_1, p_2, Y) = Yp_1^{-\alpha}P_2^{\alpha-1}$. Use the indirect function to find the marshalian demand function **(5 Marks)**

b. A consumer has a utility function: $U(x_1, x_2) = min\{x_1, 3x_2\}$, Calculate

i. The consumer's demand function **(3 Marks)**

ii. Indirect utility function **(3 Marks)**

iii. Expenditure function **(4 Marks)**

QUESTION TWO

A farmer uses two inputs—labor (L) and capital (K)—to produce wheat, with the production function $Q = 100K^{0.5}L^{0.5}$, where Q is the quantity of wheat produced. The price of labor is w=KES 200 per unit, and the price of capital is r=KES 400 per unit.

a) Derive the cost function for this farm. **(3 Marks)**
b) Find the optimal combination of labor and capital to minimize costs for producing 200 units of wheat. **(6 Marks)**
c) How would an increase in the price of capital affect the farmer's cost-minimizing choice of inputs? Illustrate using a diagram. **(6 Marks)**

SECTION B

QUESTION THREE

Suppose a consumer has a utility function given as $U = x_1^{\propto}x_2^{\beta}$. Let p_1 and p_2 be the price of good 1 and good 2 and assume the consumer's wealth is w.

a. Derive the consumer's Walrasian demand function and indirect utility function **(8 Marks)**
b. Derive the consumer's expenditure function and Hicksian demand function (**7 Marks**)

QUESTION FOUR

Consider an individual with a current wealth of KES 1,500,000 who faces the prospects of a 25% chance of losing his or her car worth KES 200,000 through theft in the next year. Suppose this person utility index is logarithmic U(w)=ln(w).

a. If this person faces next year without insurance, what is his expected utility **(3 Marks)**
b. What will be a fair insurance in this case? **(5 Marks)**
c. If this person completely insures their car, what will be their wealth and expected utility? **(4 Marks)**
d. What is the maximum amount that might be paid for their insurance? (**3 Marks**)

QUESTION FIVE

a. Explain how the concept of diminishing marginal utility influences food consumption decisions. Provide an example of how a change in income affects consumer choices for agricultural products. **(5 Marks)**

b. Discuss the concept of economies of scale in agricultural production. How might increasing farm size affect cost structures and profitability in the long run? **(5 Marks)**

c. How does risk aversion influence a farmer's decision to adopt new technologies, such as drought-resistant seeds? Discuss using expected utility theory. **(5 Marks)**

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