CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION

AGEC 241: PRODUCTION ECONOMICS

STREAMS: **TIME: 2 HOURS**

DAY/DATE: THURSDAY 19/12/2024 **11.30 A.M – 1.30 P.M**

INSTRUCTIONS:

(i) Answer **QUESTION ONE** and any other **THREE** questions

(ii) Do not write on the question paper

QUESTION ONE

a) Discuss the goal of production economics. **(4 Marks)**

b) Distinguish between Technical, Economic, and Allocative Efficiency **(6 Marks)**

c) Define increasing returns to scale and provide an example of how it might be observed in agricultural production. **(3 Marks)**

d) Explain the concept of isoquants and their importance in agricultural decision-making. **(3 Marks)**

e) Differentiate between price risk and yield risk in agriculture. **(3 Marks)**

f) What is the marginal value product (MVP), and how is it used in determining optimal input levels in production? **(3 Marks)**

g) Briefly describe the relationship between technology adoption and productivity in agriculture. **(3 Marks)**

QUESTION TWO

Consider the following production function for a dairy farm:

$$Q = 50K^{0.4}L^{0.6}$$

where Q is output (liters of milk), K is capital (barn space), and L is labor (in hours).

a. Calculate the marginal product of capital and marginal product of labor when K=10 and L=20 **(8 Marks)**

b. If capital costs KES 100 per unit and labor costs KES 50 per hour, determine the least-cost combination of inputs to produce 500 liters of milk. **(7 Marks)**

QUESTION THREE

A farmer uses 10 acres of land and produces 10,000 Kilograms of maize. The total fixed costs amount to KES 20,000, and variable costs (e.g., seed, fertilizer) amount to KES 50,000.

a. Calculate the **average total cost** per Kilogram of maize. **(3 Marks)**

b. If the market price of maize is KES 80 per Kilogram, calculate the farmer's **total revenue** and **profit**. **(4 Marks)**

c. At what price would the farmer break even? **(8 Marks)**

QUESTION FOUR

a) Using a graph, explain economies and diseconomies of scale **(4 Marks)**

b) How can you explain to a farm manager in Marima that it is irrational to produce at stage 1 of the classical production function? **(3 Marks)**

c) Write short notes on the following concepts:

- **a.** Isocost lines **(2 Marks)**
- **b.** Ridge lines **(2 Marks)**
- **c.** Expansion path **(2 Marks)**
- **d.** Isoquants **(2 Marks)**

QUESTION FIVE

a) Identify key sources of risk in agricultural production **(7 Marks)**

b) Discuss strategies that farmers can use to manage these risks. **(8 Marks)**
