MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRIBUSINESS MANAGEMENT AND TRADE

SECOND YEAR FIRST SEMISTER EXAMINATION FOR

BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGB 203:AGRICULTURAL PRODUCTION ECONOMICS

DATE: **TIME:**

INSTRUCTIONS: Answer question ONE and any other TWO questions

QUESTION ONE (30 MARKS)

a) Explain the following concepts in production theory:
   i. Isoquant map (2 marks)
   ii. Production possibility curve (2 marks)
   iii. Economies of scale (2 marks)

b) Using an appropriate graphical illustration, explain the relation between production function and technology advancement (4 marks)

c) Differentiate between short-run and long run periods in production citing relevant examples from production economics (4 marks)

d) Citing relevant examples, explain the four factors of production (4 marks)

e) Distinguish between the law of diminishing return and the law of returns to scale (4 marks)

f) The data below shows tabulation on the production of a hypothetical product

Output (Q)	0	2	3	4	5	6	7	8
Total cost (Kes)	25	32	38	42	48	58	67	98

Using the above data determine:

i) The average fixed cost when output equals 6 units (2 marks)

ii) The average variable cost when output equals 8 units (2 marks)

iii) Marginal cost of 3rd and 6th unit of output (4 marks)

QUESTION TWO (20 MARKS)

a) Given that the quantity of output (Y) is a function of two variable input (X_1 and X_2), derive the expression that relates the Marginal Rate of Technical Substitution (MRTS) to Marginal Physical Product (MPP) of inputs (X_1 and X_2) (4 marks)

b) Using the three stages of production, describe the production economic decisions that you would rather consider when giving advice to the small-scale farmers to boost their level of output using the available amount of input. (6 marks)

c) Using relevant illustrations and examples, describe five impacts of adoption of technology in agriculture on the production functions under competitive conditions (10 marks)

QUESTION THREE (20 MARKS)

a) Suppose a production function is given as $Y = 50 + 5.93X^{0.5}$. Given X=0, 1,2,5 and 10. Calculate the;

i. Total product (2 marks)
ii. Average product (2 marks)
iii. Marginal product (2 marks)

b) Citing relevant examples, explain the difference between risk and uncertainty in agricultural production (4 marks)

c) Using an agricultural enterprise of your own choice;

i. Explain five risks affecting that enterprise (5 marks)
ii. Explain policy interventions that can be implemented to reduce vulnerability of mentioned risks in (2) above (5 marks)

QUESTION FOUR (20 MARKS)

a) Using suitable illustrations, explain the four types of product-product relationship encountered in agricultural production (8 marks)

b) Given the output of two products is represented as (Y_1 and Y_2) with respect to a given input X_1, describe how you would determine the optimal product combination (12 marks)

QUESTION FIVE (20 MARKS)

a) The following are the input combination of input X_1 and X_2 that can produce 100 units of output. The prices of X_1 is Ksh. 30 and that of X_2 is Ksh. 15. Determine the optimal input combination. (10 marks)

X_1	X_2
0	60
5	40
10	25
15	15
20	7
25	3
30	0

b) Using suitable diagrams describe the concepts of marginal rate of input (technical) substitution and isocost line and how they interact to determine the least cost combination (10 marks)