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(Knowledge for Development)

**KIBABII UNIVERSITY
UNIVERSITY EXAMINATIONS
2021/2022 ACADEMIC YEAR
SECOND YEAR 2nd SEMESTER
MAIN EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL
ECONOMICS & RESOURCE MANAGEMENT**

COURSE CODE: AEC 225

COURSE TITLE: PRODUCTION ECONOMICS

DATE: 11TH MAY 2022

TIME: 9 – 11 AM

INSTRUCTIONS TO CANDIDATES

Answer **Question 1** and any other two (2) Questions.

Question one

- a) Briefly explain the following concepts as used in production economics
- Opportunity cost (2 marks)
 - Marginal rate of technical substitution (2 marks)
 - Risk (2 marks)
 - Elasticity of production (2 marks)
 - Technical efficiency (2marks)
- b) Consider a cost function TC (Total cost) = $200+12x-0.08x^2+0.12x^3$. Compute the following
- Total fixed cost and average fixed cost (4 marks)
 - Total variable costs and average variable cost (3 marks)
 - Marginal cost (3 marks)
- c) Explain any FIVE types of risks and uncertainties in smallholding dairy farming in Kenya (10 marks)

Question two

Given the following values of x : 2,4,6,8,10,12,14,16,18,20 and 22 and $y = X^2 - \frac{1}{24}X^3$

- Determine values of Y , APP , and MPP and their elasticities of production (10 marks)
- Draw the TPP , APP , and MPP curves and show the three regions of production (10 marks)

Question three

- a. Using relevant examples, explain the following types of production functions return relationships:
- Constant marginal rate of returns (5 marks)
 - Increasing marginal rate of returns (5 marks)
 - Decreasing marginal rate of returns (5 marks)
- b. Draw and isoquant map and state four characteristics of isoquants. (5 marks)

Question Four

- State the law of diminishing returns (3mks)
- Draw and describe the various shapes of isoquant (6mks)
- Describe the type of product – product relationship encountered in agricultural production (5mks)
- Highlight six factors that influence the choice of production function of a firm. (6mks)

Question Five

Lucerne Hay and maize combinations necessary to produce 50 litres of milk per day by a Holstein cow at a Nakuru dairy farm has been given in table below. It shows how and to what extent Hay could be substituted for maize.

Combination number	Maize (X_1) (kg)	Hay (X_2)(kg)	MRS X_2 for X_1
1	13.0	8	
2	9.4	10	
3	7.1	12	
4	5.7	14	
5	4.7	16	
6	3.9	18	
7	3.4	20	
8	2.9	22	
9	2.6	24	
10	2.3	26	

- Calculate the MRS X_2 for X_1 and complete the last column (12 marks)
- If the price of maize is kshs 9 per kilogram and hay it is ksh 3 per kilogram, use this information to determine the least cost combination of maize and hay for use by the dairy farm. Clearly explain your answer (8mks)