



# MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRIBUSINESS MANAGEMENT and TRADE

DECEMBER SESSION EXAMINATION FOR

BACHELOR OF EDUCATION

KBT 203: AGRICULTURE PRODUCTION ECONOMICS

DATE: SCHOOLBASED

TIME:

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**INSTRUCTIONS:** Answer question one and any other two questions

**QUESTION ONE (COMPULSORY)(30 MARKS)**

a) Define the following terms:

- i) Expansion path (1 mark)
- ii) Uncertainty (1 mark)
- iii) Isoquant (1 mark)
- iv) Production function (1 mark)
- v) Returns to scale (1 mark)

- b) i) Use a diagram to describe a factor- factor relationship (4 marks)
- ii) Given that the relationship between the yields from one acre of maize and the amount of Nitrogen (x) applied per acre of land is given by the following production function:

$$Y=0.30x+0.002 x^2 -0.00001x^3$$

Determine the yields of maize(Y) in Kg when 200 Kg of Nitrogen is applied in 1 acre

(3 marks)

- c) i) Explain two causes of shifts in the production possibility frontiers (3 marks)
- ii) Explain the difference between fixed and variable inputs. (2 marks)
- d) i) Describe three sources of diseconomies of scale in a farm that is involved in Maize production in Nyahururu (6 marks)
- ii) Describe two sources of risk in agriculture production (2 marks)

- iii) Explain the difference between an implicit cost and an explicit cost in production economics (2 marks)

**QUESTION TWO (20 MARKS)**

- a) i) Explain the significance of the degree of homogeneity in a production function (5 marks)
- ii) Use a diagram to explain the difference between sufficient and necessary conditions in profit maximization (5 marks)
- b) Suppose that a production function is given by

$$P=200-q_1-q_2$$

Complete the given table (10 marks)

Input Fertilizer (Kg)	Total Physical Product(TPP)	Marginal physical product(MPP)	Average physical product(APP)
20			
35			
40			
45			
50			

**QUESTION THREE: (20 MARKS)**

- a) A farm in Nakuru uses a combination of two inputs  $X_1$  and  $X_2$  to produce 200 units of a product Y.

Combinations	Unit of $X_1$	Unit of $X_2$
1	60	0
2	40	5
3	25	10
4	15	15
5	7	20
6	3	25
7	0	30

- i) Calculate the marginal rate of substitution (10 marks)
- ii) The prices of  $X_1 = \text{Ksh } 10$  and  $X_2 = \text{Ksh } 8$ . What is the appropriate combination for the two inputs? (5 marks)

- b) Explain five conditions of the least cost combination criterion as used in a wheat farm in Nakuru County (5 marks)

**QUESTION FOUR (20 MARKS)**

- a) Describe five factors that would influence the adoption of a new wheat variety in Nakuru (10 marks)
- b) Explain five effects of adoption of technology has on the production of a farm which has a competitive market. (10 marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain the main two types of efficiency in relation to a production possibility Frontier. (4 marks)
- b) Explain elasticity of factor substitution using a well labeled diagram (4 marks)
- c) Explain the differences in the three production areas on a classical production function. Use a sketch graph to illustrate your answer. (12 marks)