



MACHAKOS UNIVERSITY

University Examinations for 2017/2018 Academic Year

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF DEPARTMENT OF AGRIBUSINESS MANAGEMENT
FIRST YEAR FIRST SEMESTER EXAMINATION FOR BACHELOR OF EDUCATION
AGB 203: AGRICULTURAL PRODUCTION ECONOMICS

DATE:4/12/2017

TIME:8.30-10.30 AM

Instructions:

Answer question one and two other questions

QUESTION ONE

- (a) Define the following terms:
- (i) Production Possibility curve (2 marks)
 - (ii) Risk averse (2 marks)
 - (iii) Cost function (2 marks)
 - (iv) Economies of scale (2 marks)
 - (v) Competitive products (2 marks)
- (b) (i) Use a sketch graph to distinguish between the Marginal physical product(MPP) and the Average Physical Product(APP) based on elasticities of production (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:

$$Y=0.60x+0.003 x^2 -0.00002x^3$$

Determine the yields of maize(Y) in Kg when 100 Kg of Nitrogen is applied in 1 acre

(3 marks)

- (c) (i) The average variable cost function is given by: $AVC = 30 - 3.6Y + 0.2Y^2$, where Y is output. Derive the marginal cost function (3 marks)
- (ii) Differentiate between an Isoquant and Isoclines (2 marks)
- (d) (i) Explain the most rational region of operation based on your knowledge of the classical production function (3 marks)
- (ii) Describe three sources of risk in agriculture production using a maize farmer in Kitale as your point of reference (3 marks)
- (iii) Describe two types of production functions in agriculture production (2 marks)

QUESTION TWO (20 MARKS)

- (a) (i) Differentiate between the marginal rate of input substitution and elasticity of production. (5 marks)
- (ii) Describe the relationship between isoclines and an expansion path using a clearly labeled diagram. (5 marks)
- (b) Suppose that a production function is given by $Y = PQ$, where Y is output and P and Q are variable inputs. If the price of P = Ksh10, price of Q = Ksh 20 and price of Y = Ksh.100. How much of the two inputs would you purchase to give the maximum output ,given that you have Ksh.1000 to spend on both of them (10 marks)

QUESTION THREE: (20 MARKS)

- (a) A farm in Nakuru uses a combination of two inputs X1 and X2 to produce 200 units of a product Y.

Combinations	Unit of X1	Unit of X2
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) State 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 cassava variety in Kibwezi. (10 marks)
- (b) Explain five potential effects of that the adoption of technology has on the economy of a country which has a competitive market (10 marks)

QUESTION FIVE (20 MARKS)

- (a) Describe the following types of enterprises using relevant agriculture products:
 - (i) Complementary (3 marks)
 - (ii) Supplementary (3 marks)
- (b) Describe three sources of diseconomies of scale in a farm that is involved in Barley production in Nyahururu (6 marks)
- (c) Given the following production functions:

$$Y_1 = AX_1^{0.5} X_2^{0.5}$$

$$Y_2 = AX_1^{0.5} X_2^{0.8}$$

- (i) Show the degree to which these functions are homogenous (6 marks)
- (ii) Give the interpretation of the results in (i) (2 marks)