



MAASAI MARA UNIVERSITY
REGULAR UNIVERSITY EXAMINATIONS
2018/2019 ACADEMIC YEAR
SECOND YEAR FIRST SEMESTER

SCHOOL OF BUSINESS AND ECONOMICS
BSC. ECONOMICS, BSC. ECON & STAT, BSC.
FIN ECON, BSC. AGBM

COURSE CODE: ECO 2104/AGB 2107

COURSE TITLE: PRODUCTION ECONOMICS

DATE: 7TH DECEMBER 2018

TIME: 11.00AM- 13.00PM

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE** and any other **THREE** questions

This paper consists of 4 printed pages. Please turn over.

QUESTION ONE

- a) Clearly distinguish between the following concepts and terms as used in Production Economics:
- Iso-revenue line and Iso-cost line
 - Rate of Technical Substitution and Rate of Product Transformation
- (6 marks)
- b) Deborah has the following Marginal Physical Product (MPP) function in her milk production plant:

$$MPP = 4 + 8x - 0.3x^2 \quad \text{where } C = 0$$

At what level of input x does:

- TPP reach its maximum
 - APP reach its maximum
 - MPP reach its maximum
 - Stage 2 of production begin and end
- (8 marks)
- c) Discuss the computational difficulties in Linear Programming as a farm firm optimization technique (3 marks)
- d) Discuss the goals of Production Economics (5 marks)
- e) Find the homogeneity of the following production function and state its returns to scale:

$$24X^{1/2}Y^{3/2} - 2X^3/Y \quad (3 \text{ marks})$$

QUESTION TWO

- a) State Euler's Theorem as used in production economics (2 marks)
- b) Briefly discuss the properties/characteristics of Cobb-Douglas Production Functions (7 marks)
- c) Alamin has a coffee firm in Kiambu having the following functions:

$$Q = 0.8P - 20$$

$$TFC = 180$$

$$AVC = 4 + 2Q$$

Find Alamin's profit maximizing level of output and his profit (6 marks)

QUESTION THREE

- a) Using well labelled diagram distinguish between Competitive, Joint, Supplementary and Complementary products/enterprises

(6 marks)

- b) Edith has the following maize production function

$$Q = 2K^{0.5}L^{0.3}$$

Where Q is the quantity of maize produced while K and L are units of inputs capital and labour respectively. Supposing that a bag of maize sells at Ksh. 400, the prices of K and L are Ksh 16 and Ksh. 4 respectively, and that he has a total of Ksh. 5000 to spend on the two inputs:

- i. Using Lagrangean optimization technique determine the quantities of K and L that Edith will need in order for him to maximize profit

- ii. What will be Edith's maximum profit

(9 marks)

QUESTION FOUR

- a) Discuss the steps which should be followed by a farm manager while making decisions in conditions of risk

(6 marks)

- b) Njoki has the following production relationship in her Irish Potato farm:

$$y = 2x^{1/2}$$

Where y and x are quantities of inputs and outputs respectively. If the price of y is ksh. 8, price of x is ksh. 2 and Total Fixed Costs are ksh. 30, calculate:

- i. The profit maximizing level of input
ii. The profit maximizing level of output

(9 marks)

QUESTION FIVE

- a) Briefly discuss the assumptions of linear programming as an optimization technique in scarce resource allocation **(5 marks)**
- b) Given the following

$$\text{Max } Z = 4X_1 - X_2 + 2X_3$$

Subject to:

$$2X_1 + X_2 + 2X_3 \leq 6$$

$$X_1 - 4X_2 + 2X_3 \leq 0$$

$$5X_1 + 2X_2 - 2X_3 \leq 4$$

$$X_1, X_2, X_3 \geq 0$$

Determine the optimal solutions

(10 marks)

.....END.....