



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)

University Examinations for 2015/2016 Academic Year

SCHOOL OF AGRICULTURE AND NATURAL RESOURCES MANAGEMENT

DEPARTMENT OF AGRICULTURAL RESOURCE MANAGEMENT (KRM)

**Second Year First Semester Examination for Degree in Agricultural Education
and Extension**

KBT 203

AGRICULTURAL PRODUCTION ECONOMICS

Date: xxx

Time: 2hrs

Instructions: Answer ALL questions in section A and ANY TWO questions in section B

Section A: 30 MARKS

Question 1

- a. Define the following economic terms
 - i. Marginal rate of technical substitution **[2 Marks]**
 - ii. Law of diminishing marginal productivity **[2 Marks]**
 - iii. Expansion path **[2 Marks]**
- b. Explain the terms *necessary* and *sufficient*, in terms of a farmer seeking to maximize profits in agricultural production. **[4 Marks]**
- c. Explain the dual relationship between production function cost function **[6 Marks]**
- d. Describe three types of isoquants as applied in production economics **[6 Marks]**

- e. Describe four main contexts of the production environment that influences the production process **[8 Marks]**

SECTION B: 40 MARKS

Question 2:

- a. Differentiate between risk and uncertainty **[4 Marks]**
- b. i) Explain any six risks affecting agriculture and livestock sector in Kenya. **[6 Marks]**
 ii) Explain any six strategies for tackling these risks both at national and county levels . **[6 Marks]**
- c. Suppose a farmer is faced with FOUR production decisions: 1) Grow maize 2) Grow wheat 3) Keep dairy 4) Grow vegetables. We assume that nature has two states, one producing high yields (high rainfall) and the other producing low yields (low rainfall). Further, given that the probability and returns from the interaction of these states of nature as follows, which decision should the farmer take and why? **[4 Marks]**

Farmers' production decision	High yields P=0.7	Low yields P=0.3
1. Grow Maize	Ksh 40,000	Ksh 9,000
2. Grow wheat	Ksh 31,000	Ksh 18,000
3. Keep Dairy	Ksh 42,000	Ksh 15,000
4. Grow vegetables	Ksh 35,000	Ksh 12,000

Question 3:

- a. Explain production possibility frontier **[6 Marks]**.
- b. Explain the three types of returns to scale in production **[6 Marks]**
- c. What do competitive, supplementary, complementary, and joint enterprises each imply about the shape of the production functions that underlie the product transformation functions? **[8 Marks]**

Question 4:

- a. Explain the impacts of technology on the production functions. **[6 Marks]**
- b. Given the tabular form of the production function, input and output as follows

Input (Number of Laborers)	Total product (TPP _L)
0	0
1	8
2	24
3	46
4	72
5	100
6	128
7	154
8	176
9	192
10	200
11	198
12	184

- i. Evaluate:
 - a) Average physical product **[3 Marks]**
 - b) Marginal physical product **[3 Marks]**
 - c) Elasticity of production **[3 Marks]**
- ii. Identify and explain the three stages of production. What is the rational stage of production? **[5 Marks]**

Question 5:

- a. Explain the difference between total cost (TC) and total factor cost (TFC).
[5 Marks]
- b. Whenever the total factor cost function and the total value of the product function are parallel to each other, profits will be maximized.
- i) Is this statement true or false? **[1 Marks]**
 - ii) Give reasons for the above **[4 Marks]**
- c. Suppose that the price of the input x is Ksh 3. Total fixed costs are Ksh 200. Given the quantity of input (x) and output (y) as below:

Input (x)	Output (y)
0	0
10	50
25	75
40	80
50	84

Evaluate

- i. Total variable cost **[2 Marks]**
- ii. Total cost **[2 Marks]**
- iii. Marginal cost **[2 Marks]**
- iv. Average variable cost **[2 Marks]**
- v. Average cost **[2 Marks]**