JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF AGRICULTURE AND FOOD SCENCES

SECOND SEMESTER THIRD YEAR EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRIBUSINESS MANAGEMENT 2016/2017 ACADEMIC YEAR

COURSE CODE: AAE 3321

COURSE TITLE: CROP AND LIVESTOCK PRODUCTION ECONOMICS

EXAM VENUE: **STREAM: (BSc. Agribusiness Management)**

DATE: **EXAM SESSION:**

TIME: 2 HRS

Instructions:
Answer **ALL** the questions in section **A** and any **TWO** in section **B**
Do not write on this question paper
Each question in section **B** carries equal marks

SECTION A [30 MARKS]

Answer all questions in this section

1. Agricultural Production Economics is an applied field of science where the principles of choice are applied to the use of capital, labour, land and management of resources in the farming industry.
    a) Outline two goals of production economics. [2marks]
    b) Differentiate between the following terms as used in production economics:
        i. Long-run and Short-run production period [2marks]
        ii. Optimum and Marginalism [2marks]
    c) Explain any four types of production functions. [4marks]

2. Suppose a production function of a farm is given as; $Y = 4x + 3x^2 – 0.2x^3$. Find;
    a) Average product and marginal product when x is 4 and consequently elasticity of production. [6marks]
    b) The value of x when the average product is at maximum and marginal product is zero. [4marks]

3. Economies of scale is a long run concept and refers to reductions in unit cost as the size of a facility and the usage levels of other inputs increases.
    a) Briefly, explain some of the sources of economies of scale in a farm. [5marks]
    b) Economic efficiency refers to the use of resources so as to maximize the production of goods and services. State three conditions that must hold for economic efficiency to prevail. [3marks]
    c) Differentiate between diversification and integration of enterprises. [2marks]

SECTION B [40 MARKS]

Answer any TWO QUESTIONS in this Section.

4. Manyatta farm has the following production function, $Y=f(X_1 \mid X_2, X_3 \ldots\ldots X_n)$. It must pay KES 1 per unit of fertilizer and KES. 10 for the fixed inputs of land.

Output(Y)	Fertilizer (50 kg bag)	Land (hectares)
0	0	15
20	7	15
40	17	15
60	30	15
80	55	15
100	95	15
120	180	15

a) Determine:

i. Total fixed cost [2marks]
ii. Total variable cost [2marks]
iii. Total cost [2marks]
iv. Average Fixed Cost [2marks]
v. Average Variable Cost [2marks]
vi. Average Total Cost and [2marks]
vii. Marginal Cost for each level of output. [2marks]

b) Giving relevant examples, explain what is meant by technical economies and market economies. [6marks]

5. The following production function is from a dairy farm in Kiambu county. The farm manager must decide on the best combination of hay(X_1) and grain(X_2) to use in feeding the dairy cows. The production function is given as;

$$Y = \text{If } 18X_1 - X_1^2 + 14X_2 - X_2^2$$

a) What level of inputs maximize output? [6marks]

b) Calculate the level of maximum output. [2marks]

c) Does the production function exhibit diminishing returns? [3marks]

d) Returns to scale describe the relationship between inputs and outputs in a long-run production function. Illustrate and briefly explain three types of returns to scale in production. [9marks]

5. The following is a hypothetical production function of output (Y) using input X:

Input (X)	**Output (Y)**
0	0
1	5
2	14
3	21
4	26
5	30
6	33
7	35
8	36

9	36
10	35

a) If the price of X (P_x) is Kshs 50 and the price of output (P_y) Kshs 20, find;
   i. The level of input that maximize profit. [5marks]
   ii. The level of output that maximizes profit. [5marks]

b) Describe the relationship between inputs as exhibited by agricultural production. [8marks]

c) What is the significance of the slope of the isoquant to an agricultural production economist. [2marks]