MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL ECONOMICS, AGRIBUSINESS MANAGEMENT ANIMAL SCIENCE AND FORESTRY AND AQUACULTURE WITH INFORMATION TECHNOLOGY

MAIN CAMPUS

AEG 204: ECONOMICS OF PRODUCTION RELATIONS

Date: 14th June, 2017 Time: 8.30 - 6.30pm

INSTRUCTIONS:

- Answer ALL Questions
- Start every question on a new page

Question 1 **(18 marks)**

Given the following production function:

$$y = 4x + 0.06x^2 - 0.001x^3$$

a) Complete the table below: (10 marks)

Input (x)	Output (y)	Average physical product (APP)	Marginal physical product (MPP)	Elasticity of production (E_p)
0				
5				
10				
15				
20				
25				
30				
35				
40				
45				
50				
55				
60				
65				
70				
75				
80				

b) Draw the graph of y (TPP) against x. (2 marks)

c) Below the graph of y against x and using the same horizontal scale, draw the graphs of *APP* and *MPP*. (2 marks)

d) Mark the stages of the neoclassical production function (2 marks)

e) Describe the stages of the production function with respect to the elasticity of production (2 marks)

Question 2 **(20 marks)**

The following is the production function of a farm in Maseno.

$y = x_1 + 0.1x_1^2 - 0.05x_1^3 + x_2 + 0.1x_2^2 - 0.05x_2^3$

a) Find the maximum output and the corresponding level of input use at which output is maximized. (6 marks)

b) Assume that price of the output is $2 per unit, what level of input use will maximize the total value of the product? (6 marks)

c) The price of output increases to $3, the price of input x_1 is $5 and the price of input x_2 is $4. Is it possible to produce and achieve a profit? (8 marks)

Question 3 (20 marks)

a) What is an iso-cost line in production economics? (2 marks)

b) A farmer has sh.10,000 available for the purchase of two inputs x_1 and x_2. Input x_1 costs sh.500 and input x_2 costs sh.300 per unit. Given that values of x_1 range between 0 and 20, present in a table six possible combinations of x_1 and x_2 that could be purchased with the sh.10,000 (6 marks)

c) Using the example in b, show that the slope of an iso-cost line is equal to the inverse input price ratio. (4 marks)

d) How can one determine the least cost combination of inputs x_1 and x_2? (2 marks)

e) The following table presents combinations of two inputs which can produce the same level of output

Output, y	Input 1, x_1	Input 2, x_2
20	0	20
20	8	16
20	16	12
20	24	8
20	32	4
20	40	0

If the price of x_1 is sh.200 and the price of x_2 is sh.300; what is the least cost combination of x_1 and x_2? (6 marks)

Question 4 **(12 marks)**

a) Distinguish between economies of size and economies of scale as used in production economics (4 marks)

b) It is really difficult for a farmer to achieve an increase in the scale of his/her operations. Why is this so? Use an example (2 marks)

c) Using graphs plotting x_1 on the horizontal axis and x_2 on the vertical axis, describe a case where there is economies of scale, constant returns to scale, and diseconomies of scale. (6 marks)