CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION AND EXTENSION

AGEC 241: PRODUCTION ECONOMICS

STREAMS: BSC (AGED)Y2S2 **TIME: 2 HOURS**

DAY/DATE: TUESDAY05/12/2017 **11.30 A.M. – 1.30 P.M.**

INSTRUCTIONS: ANSWER ALL QUESTIONS

QUESTION ONE

(a) Given a single variable factor production function $Y = 16x^2 - 4x^3$

Find the input levels that form the boundaries of stage II of production. [10 marks]

(b) Given the following production function

$Y = 3x + 2x^2 - 0.1x^3$ [10 marks]

Compute

(i) Average product if x=6

(ii) Marginal product if x=8

(iii) At what value of x is y the maximum

(c) Explain the four factors of production and their returns. [5 marks]

SECTION B – ANSWER ANY THREE

QUESTION 2

Given the cost function $TC = 20 - 6y^2 + 8y^3$ and the price of output $py = 50$

(a) Determine the profit maximizing level of output

(b) Determine the maximum profit

QUESTION 3

Chuka farm has the following production function, $Y = f(x_1, x_2,\ X_3 \ldots . X_n)$. It must pay 10 KES per unit of fertilizer and KES. 100 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 [2 marks]

(ii) Total variable cost [2 marks]

(iv) Total cost [1 mark]

(v) Average variable cost [2 marks]

(vi) Average fixed cost [2 marks]

(vii) Average total cost [2 marks]

(viii) Marginal cost for each level of output [2 marks]

(c) Draw a cost function curve and show clearly the TC, TVC and TFC [2 marks]

QUESTION 4

Lucerne and OAT combinations necessary to produce 160 litres of milk per day by a Holstein cow at a Chuka University daily farm has been given in table below. It shows how and to what extent Lucern could be substituted for oat.

Combination number	OAT (X_1) (kg)	LUCERN (X_2) (kg)	MRS X_2 for X_1
1	52	11	
2	44	12	
3	38	14	
4	33	18	
5	30	23	
6	28	29	

(a) Calculate the MRS X2 for X1 and complete the last column. [10 marks]

(b) If the price of OAT is kshs 6 per kilogram and LUCERN it is ksh 7.5 per kilogram, use this information to determine the least cost combination of OAT and LUCERN for use by the dairy farm. Clearly explain your answer. [5 marks]

QUESTION 5

(a) Explain seven measures that can be put in place to mitigate risks and help a farmer to maximize his output. [7 marks]

(b) Using diagrams, explain four characteristics of isoquant. [8 marks]
