CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL ECONOMICS, AGRIBUSINESS MANAGEMENT, FOOD SCIENCE & ANIMAL SCIENCE

AGEC 241: PRODUCTION ECONOMICS

STREAMS: BSC (AGEC, AGBM, FOST, ANSC) **TIME: 2 HOURS**

DAY/DATE: MONDAY 16/4/2018 **8.30 A.M. – 10.30 A.M.**

INSTRUCTION: ANSWER ALL QUESTIONS IN SECTION A AND ANY TWO QUESTIONS IN SECTION B

SECTION A

1. Suppose fertilizer is the only resource that is varied in producing maize. As fertilizer is increased, output of maize increase at an increasing rate, then at a decreasing rate and eventually decreases.
   (a) Show graphically how this happens [5 marks]
   (b) Discuss the relationship between output of maize and marginal physical product and average physical product. [10 marks]

2. Differentiate among the following [10 marks]
   (a) Isoquant and iso-cost line
   (b) Explain the goals of production economics

SECTION B

3. Imagine a firm has costs given by: $C(q) = 120 + 2q^2$, and revenues given by $R(q) = 100q$ (ie q is the output)
   (a) At what market price does this firm sells its output. [5 marks]
   (b) Find the profit maximizing quantity [5 marks]

(c) Write short notes in the following types of enterprises [5 marks]

(i) Complementary

(ii) Supplementary

(iii) Competitive

(iv) Joint

4. Given the average variable cost equation, $AVC = y^2 - 2y + 2$

(a) Derive the total variable cost and marginal cost equations [5 marks]

(b) At what level of output is the average variable cost at minimum. [5 marks]

(c) Using a diagram explain why average variable cost (AVC) curve slopes downward and after a point moves upwards. [5 marks]

5. For each of the following production functions, find the marginal physical product. Output is denoted by y and the inputs are denoted by x and z [6 marks]

(a) $y = 25 - 1/x - 1/z$: at $x = 2$ and $z = 2$

(b) $y = 5xz - 2x^2 = 2z^2$: at $x = 5$ and $z = 5$

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

(i) Find the input levels that form the boundaries of stage II of production. [9 marks]

6. A smallholder farmer can produce two products namely, finger millet and maize when given set of inputs in the following combinations.

combination	Finger millet	Maize	MRPS for
A	570	1519	
B	747	1461	
C	912	1390	
D	1064	1305	
E	1204	1209	
F	1331	1099	
G	1447	976	
H	1550	841	

(a) Calculate the MRPS Y_2 for Y_1 and complete the last column (clearly show your workings using algebraic method). [8 marks]

(b) Use the information in the table to determine the combination of finger millet and maize that will maximize returns when the prices of products are [7 marks]
P_{y2} = ksh 20; p_{y1} = ksh 30
