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**University Examinations 2015/2016**

THIRD YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELORS OF COMMERCE.

**BEC 3253: PRODUCTION ECONOMICS**

**DATE: AUGUST 2016 TIME: 2 HOURS**

**INSTRUCTIONS: -** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. With the use of a diagram explain one input – one output relationship keeping all other inputs fixed in the production process. (10 marks)
2. Given the following



Price of input X1=20

Price of input X2=40

Price of input X3=80

Determine the quantity of X1, X2, and X3 that the firm should use in order to maximize output. What is the output level? (10 marks)

1. Distinguish the following concepts as applied in economics
2. Marginal rate of technical substitution and marginal rate of transformation. (3 marks)
3. Marginal cost and cost complementarities (2 marks)
4. Ridge line and isoclines (2 marks)
5. Short run and long run production functions (3 marks)

**QUESTION TWO (20 MARKS)**

1. Compute the marginal rate of technical substitution of capital for labour given that X1 is capital and X2 is labour? Y=10 X10.5X20.5 (5 marks)
2. Given the following information

**Input product product**

**X Y1 Y2**

0 0 0

1 10.5 18

2 19.5 33

3 27 45

4 33 54

5 37.5 60

6 40.5 63

7 42 64.5

8 40.5 63

9 37.5 60

(i) Compute the combination of Y1 and Y2 that can be produced if the farmer is limited to 7 units of the variable input. (5 marks)

(ii) If the prices of Y1 and Y2 are KES 30 and 20 respectively, compute the profit maximizing outputs. (5 marks)

(iii) Assume you are given the following TVC function

TVC=9Y-0.6Y2+0.03Y3 instead of the above information, at what point would the farmer maximize profits if the price of that commodity is equal to KES 54? (5 marks)

**QUESTION THREE (20 MARKS)**

1. Given the following quadratic equation;

Y=18X1-X21+4X2-X22

1. Workout the least cost combination of X1 and X2 given that the price of X1 and X2 are PX1 = 2 and PX2=3. (5 marks)
2. Work out the values of X1 and X2 given that the total output Y is equal to 105 kilograms. (5 marks)
3. Given the following Cobb-Douglas production function

Q=180L0.8K0.4.

Determine;

1. Average product of labour (2 marks)
2. Average product of capital (2 marks)
3. Marginal rate of technical substitution (4 marks)
4. What is the return to scale (2 marks)

**QUESTION FOUR (20 MARKS)**

1. Define an isoquant and explain the various types of isoquants. (5 marks)
2. Discuss the causes of EXTERNAL economies of scale (5 marks)
3. Explain the causes of diminishing marginal returns to a factor (5 marks)
4. Explain the properties of Cobb Douglas production function (5 marks)

**QUESTION FIVE (20 MARKS)**

1. Assume the firm has the following total revenue and total cost functions;

AR=160-2Q

AC=900Q-1-50+3Q

Determine the level of output the firm will be to maximize profits. (10 marks)

1. Discuss the various types of risks involved in production of commodities for the market. (10 marks)