EMBU UNIVERSITY COLLEGE

(A CONSTITUENT COLLEGE OF THE UNIVERSITY OF NAIROBI)

TRIMESTER EXAMINATIONS 2013/2014

SECOND YEAR EXAMINATION FOR THE DEGREES OF BACHELOR OF SCIENCE IN AGRIBUSINESS MANAGEMENT

AEB 202B: PRODUCTION ECONOMICS

DATE: AUGUST 8, 2014   TIME: 8.30 – 10.30AM

INSTRUCTIONS:

Answer Question ONE and ANY Other TWO Questions.

QUESTION ONE

a) Briefly discuss the 3 production decisions made by business firms citing relevant examples from agricultural production   (4 marks)

b) Differentiate between short-run and long-run periods in production citing relevant examples from agricultural production   (3 marks)

c) Discuss the following concepts citing relevant examples from agricultural production:

  i.)   Law of diminishing returns   (2 marks)

ii.) Law of returns to scale (2 marks)

iii.) Equimarginal principle in factor-factor relationship (2 marks)

d) Explain the relationship between technology advancement and production function using a suitable illustration (4 marks)

e) Given that the quantity of output (Y) is a function of two variable inputs (X_1 and X_2), derive the expression that relates the marginal rate of technical substitution (MRTS) to marginal productivities of the two inputs (3 marks)

f) Briefly discuss the meaning of the term expansion path using a suitable diagram (2 marks)

g) The cost equation in the production of canned beef in a factory is given as follows:
$$C = 1000 + 100Q - 15Q^2 + Q^3$$
Where C is the total cost and Q is the quantity of beef produced. Determine average total cost, average variable cost, average fixed cost and marginal cost at 10 units of beef (4 marks)

h) Explain the difference between risk and uncertainty in agricultural production (2 marks)

i) A coffee farmer believes that there is a 40% probability of reduced prices in the next season and a 60% probability that reduction in prices will not occur. The farmer believes that the firm will earn profits of 60,000 in the event of depressed prices and 125,000 if otherwise. What is the farmer's expected profits? (2 marks)

QUESTION TWO

a) Using a suitable diagram, discuss the three stages of production function implied by the law of diminishing returns   (10 marks)

b) A firm that produces two products faces a short run situation in which only one input is variable. The production functions for the two products with respect to the variable input are shown below. The product price of Y_1 is 10 and that of Y_2 is 5. The unit factor cost of the variable input is 6.

X	Y_1	Y_2
0	0	0
5	7	11
10	13	20
15	18	28
20	22	35
25	25	41
30	27	46

Determine the optimal input use for the two products   (10 marks)

QUESTION THREE

a) Using suitable diagrams discuss the terms marginal rate of technical substitution and isocost line and how they interact to determine optimal input combination   (6 marks)

b) Using suitable diagrams discuss the three types of isoquants citing examples from agricultural production   (6 marks)

c) The following are the input combinations of input X_1 and X_2 that can produce 10 units of output. The price of ksh. X_1 is 10 and that of X_2 is Ksh.5. Determine the optimal input combination   (4 marks)

X_1	X_2
0	40
3	28
6	19
9	12
12	6
15	2
18	0

d) Suppose there is a technology advancement that reduced the amount of X_2 required to produce 10 units of output by 50 %, determine the new optimal input combination

(4 marks)

QUESTION FOUR

a) using suitable diagrams discuss the terms production possibility curve, marginal rate of product substitution and isorevenue line and how they interact to determine the optimal product combination   (6 marks)

b) Using suitable diagrams discuss the four types of product-product relationships commonly found in agricultural production   (8 marks)

c) The following are production functions of two products (Y_1 and Y_2) with respect to a given input X_1. Determine possible product combinations for 30 units of the input, then determine the optimal product combination   (6 marks)

X_1	Y_1	Y_2
0	0	0
5	7	11
10	13	20
15	18	28
20	22	35
25	25	41
30	27	46

QUESTION FIVE

a) Discuss the meaning of cost function and the 3 ways of expressing a cost function (4 marks)

b) Distinguish between average total cost, average variable cost, marginal cost, average fixed cost and marginal revenue   (5 marks)

c) Using relevant drawings, illustrate shape relationships between these costs and show how the product price can be used to determine the optimal level of output   (5 marks)

d) Given the following cost schedule, determine the optimal level of output when the product price is Ksh. 10. The firm is assumed to be operating in perfect competition   (6 marks)

Output quantity	Total cost
0	100
2	140
4	160
6	170
8	190
10	330
12	320

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