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**University Examinations 2014/2015**

THIRD YEAR, FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF COMMERCE

**BEC 3253: PRODUCTION ECONOMICS**

**DATE: APRIL 2015 TIME:** $2 $**HOURS**

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

**QUESTION ONE (30 MARKS)**

1. Distinguish between the following economic concepts as applied in production economics.
2. Incremental cost and marginal productivity (4 Marks)
3. Economics and production economics (2 Marks)
4. Comparative advantage and cost complementarities (4 Marks)
5. Economics of scope and scope of economics (4 Marks)
6. The production function for a firm is given by the following function.

Q = 80+ $K^{½}L^{½}$

The constraint is given by;

C = 2L + 2K

If the firm wishes to minimize costs for a specified output of Q0 = 88 units.

1. Express the firms cost minimization problem. (2 Marks)
2. Construct the corresponding lagrangian function. (2 Marks)
3. Determine the critical values of L and K. (4 Marks)
4. Determine the minimum costs. (4 Marks)
5. Describe the Euler’s theorem. (4 Marks)

**QUESTION TWO (20 MARKS)**

1. A firm produces two products (Q1 and Q2 and it has the following profit function;

TC = 80 Q1 –$2Q\_{1}^{2}$ - $Q\_{1}Q\_{2}$- 3$Q\_{2}^{2}$+ 100 $Q\_{2}$

The firm must observe a production quota given by:

Q1+ Q2 = 12

1. Determine the output mix which will maximize profits, subject to the quota restriction. (6 Marks)
2. Determine the level of profits attained. (4 Marks)
3. For the following production functions, determine the degree of homogeneity.
4. Q = K – L (2 Marks)
5. Q = $K^{2}$ - KL + $L^{2}$ (2 Marks)
6. Q = $\frac{1}{K^{2}}$ + $\frac{1}{KL}$ (2 Marks)
7. Q = A$K^{∝}L^{β}$ (2 Marks)
8. Q = $K^{2}$ - LK (2 Marks)

**QUESTION THREE (20 MARKS)**

1. After conducting a market survey a company manufacturing bulbs discovers that the price of bulbs varies with the quantity of bulbs as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Q | 10 | 8 | 6 | 4 | 2 |
| P | 2 | 3 | 4 | 5 | 6 |

1. Assuming a linear relationship, Find the demand function facing the firm.(6 Marks)
2. Determine the corresponding Total Revenue Function. (4 Marks)
3. If the Total Cost Tc = 100 + 10Q – 3Q2 + 3Q2. Find the corresponding profit function (6 Marks)
4. Explain the key assumptions of production economics. (4 Marks)

**QUESTION FOUR (20 MARKS)**

1. With the aid of a diagram explain the law of dimishing marginal returns to a factor.

(10 Marks)

1. With the aid of algebra explain the properties of cob-douglas production function.(6 Marks)
2. Distinguish between ridge lines and isoclines. (4 Marks)

**QUESTION FIVE (20 MARKS)**

1. Explain the causes of increasing marginal returns to a factor. (6 Marks)
2. A firm has the following production function;

Q = 100 $L^{2}K^{2}$ - 2LK

Given the price of labour (L) is 200 KES per hour and the price of capital (K) is 400 KES per machine hour and the firm’s cost budget is 25,000 KES.

**Required:**

1. Determine the optimal input combination of capital and labour. (8 Marks)
2. Determine the optimal output level. (6 Marks)