

CHUKA



UNIVERSITY

UNIVERSITY SUPPLEMENTARY/SPECIAL EXAMINATIONS.

FIRST YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURAL EDUCATION.

BCOM 272/BCOM 236/BBAM 272/ECON 434/AGEC 415: OPERATIONS RESEARCH I

STREAMS:

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 12/09/2018

11.30 A.M -1.30 P.M

INSTRUCTIONS

- ANSWER QUESTION ONE AND ANY TWO QUESTIONS.

- (a) Discuss any Five Benefits of using Operations research models in business and management [10 Marks]
- (b) Discuss any Five Operations research techniques used in Kenya in solving problems [10 Marks]
- (c) ABC Ltd has four plants namely J,K, L and M and manufactures four products P₁, P₂, P₃, and P₄. Each of the plants can manufacture any of the four products. The following data relates to the company.

| PLANTS | PRODUCTS PROFITABILITY (000) | | | |
|--------|------------------------------|----------------|----------------|----------------|
| | P ₁ | P ₂ | P ₃ | P ₄ |
| J | 11 | 18 | 14 | 11 |
| K | 15 | 17 | 16 | 15 |
| L | 13 | 15 | 14 | 12 |
| M | 13 | 11 | 16 | 13 |

Determine the assignment that will maximize profits for the company [10 Marks]

- (a) Discuss any Five differences between CPM and PERT techniques in project management

[5 Marks]

(b) A company plans to start a project whose activities have been listed as follows;

| <u>Activity</u> | <u>Preceding activity</u> | <u>Duration in Weeks</u> |
|-----------------|---------------------------|--------------------------|
| A | - | 6 |
| B | - | 4 |
| C | - | 2 |
| D | C | 7 |
| E | B, D | 4 |
| F | A, E | 10 |
| G | A, E | 2 |
| H | F | 6 |
| I | G | 11 |
| J | C | 16 |
| K | H, I | 8 |

Required

- (i) Draw a Network diagram for the project [8 Marks]
- (ii) Determine the critical path and the project duration [4 Marks]
- (iii) What is the effect of delaying activity B , I and J for two weeks each? [3 Marks]

3 (a) Discuss any Five objectives of inventory control and management [10 Marks]

(b) Jambo Ltd uses item X₃₀ in its production process. The following information relates to the company's inventory policy.

| | Minimum | Normal | Maximum |
|----------------------|----------------|---------------|----------------|
| Lead Time in days | 6 | 8 | 12 |
| Demand in units /day | 70 | 80 | 105 |

The calculated Economic Order Quantity is 300 Units.

Required

- (i) Reorder Level
- (ii) Minimum Stock Level
- (iii) Maximum Stock Level
- (iv) Average stock Level [10 Marks]

4. (a) Discuss any Five benefits of using Linear Programming in solving business problems [5 Marks]

(b) A company produces two products A and B that share the total production capacity of ten tones per week. The Company has a permanent contract of supplying at least four tones of product A and at least five tones of product B per week to other companies. Each tone of product A requires 20 machine hours production time and each tone of product B requires 50 machine hours production time. The weekly maximum available machine time is 400 hours. All the firms output can be sold and the profit made is Kshs. 90 per ton of product A and Kshs. 130 per ton of product B. The company wants to use the linear programming technique to maximize its weekly profits.

Required

- (i) Formulate the problem as a linear programming problem [5 Marks]
 - (ii) Using the graphical method show the feasible region [5 Marks]
 - (iii) Give any Five limitations of using the graphical method to solve Linear programming problems. [5 Marks]
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