CHUKA   **UNIVERSITY**

UNIVERSITY SUPPLEMENTARY/SPECIAL EXAMINATIONS.

EXAMINATION FOR THE AWARD OF DIPLOMA IN PROCUREMENT AND LOGISTICS MANAGEMENT

DPLM 0122/DPLM 0161: OPERATIONS RESEARCH

STREAMS: DPLM   **TIME: 2 HOURS**

DAY/DATE: TUESDAY 24/07/2018   **11.30 A.M - 1.30 P.M**

INSTRUCTIONS:
- **Answer QUESTION ONE and any other TWO Questions.**

1. (a) What are the characteristics of Operation Research?   [10 Marks]
   (b) Discuss any five advantages of using models to solve business problems.   [10 Marks]
   (c) Discuss any five limitations of Operation Research.   [10 Marks]

2. (a) State and explain any five rules/guidelines that help in drawing the correct structure of a network diagram.   [10 Marks]

   (b) A project consists of the following activities;

Activity	Name of Activity	Preceding Activity	Estimated Time in Weeks
1-2	A	None	3
1-3	B	None	5
1-4	C	None	4
2-5	D	A	2
3-5	E	B	3
4-6	F	C	9
5-7	G	D, E	8
3-6	H	B	7
6-7	I	H, F	9

Required:
Draw a network diagram for the project and determine the critical path and project duration.
                                                                                 [10 Marks]

3. (a) Give any five advantages of the reorder level system in managing inventories.   [5 Marks]
(b) The following data relates to component K_{10}

      Maximum monthly usage   300 units
      Maximum monthly usage   200 units
      Lead time   2-6 months
      Reorder quantity   750 units

Calculate:
      (i) The re-order level
      (ii) The minimum stock level
      (iii)   The average stock level   [15
         Marks]

4. (a) State and explain any five requirements for linear programming.   [10 Marks]

(b) A company produces two product 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:
Formulate the problem as a liner programming problem.   [10 Marks]
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