

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**SPECIAL/RESIT**

**EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COMMERCE**

**BCOM 263: OPERATIONS RESEARCH I**

**STREAMS: BCOM**

**TIME: 2 HOURS**

**DAY/DATE: TUESDAY 11/8/2021**

**11.30 A.M. – 1. 30 P.M.**

**INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS.**

1. (a) Discuss any **Five** Characteristics of Operations research **(10 Marks)**

(b) Discuss the steps which are followed when solving Operations Research problems

**(10**

**Marks)**

(c) ) Ndagani Secretarial Bureau has employed five copy typists. There are five reports to be typed and each typist is assigned one report at a time. The average profit in hundred shillings by each typist is as shown in the following table;

TYPISTS	REPORTS				
	1	2	3	4	5
Alice	8	14	15	8	12
Beth	10	15	14	11	12
Carol	12	14	17	11	14
Diana	10	11	15	11	15
Ester	14	17	20	13	17

**Required**

Determine the optimal assignment and the profit made

(10 Marks)

2. A company plans to start a project whose activities have been listed as follows;

<u>Activity</u>	<u>Preceding activity</u>	<u>Duration in Months</u>	<u>Activity cost</u>
A	-	9	300
B	-	4	200
C	A	7	400
D	A, B	8	300
E	C, D	7	500
F	C	5	600
G	E	10	800
H	F,G	8	350

**REQUIRED**

- (i) Draw a Network diagram for the project (8 Marks)
  - (ii) Determine the critical path and the project duration (6 Marks)
  - (iii) Calculate the cost of the project (6 Marks)
3. (i) Explain any Five Requirements in using the linear programming technique (5 Marks)
- (ii) 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 (6 Marks)

(ii) Write the problem in standard form and show the Entering Variable, the Leaving Variable and the Pivot Element **(9**

**Marks)**

4. (i) State the benefits of using the Reorder level system in inventory management **(10 Marks)**

(ii) Discuss the role of using computers in solving operations research problems **(10 Marks)**

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