

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

RESITS/SPECIAL

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR  
OF COMMERCE, PROCUREMENT AND LOGISTICS MANAGEMENT, BACHELOR  
OF COOPERATIVE MANAGEMENT, BACHELOR OF ENTERPRISE  
ENTREPRENUERSHIP MANAGEMENT

BCOM 263: OPERATIONS RESEARCH I

STREAMS: "AS ABOVE"

TIME: 2 HOURS

DAY/DATE: MONDAY 01/02/2021

2.30 P.M. – 4.30 P.M.

**INSTRUCTIONS: Answer question ONE and any other TWO questions**

1. (a) Operations Research has grown and become a major discipline in Kenya of today.  
Discuss five characteristics of operation research [10 marks]
- (b) Discuss the importance of using models in solving business problems [10 marks]
- (c) A shop has several machines that can do the different jobs that are available. From the past records the time in hours that each machine can take to do each job is as shown in the following table

JOBS	MACHINE TIME HOURS			
	M1	M2	M3	M4
A	5	13	4	10
B	15	3	10	8
C	12	4	8	9
D	2	11	14	5

**Required:** Assign the Machines each job so as to minimize the time of doing the jobs.

(10

marks)

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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 the 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:**

i.) Draw a network diagram for the project (6 marks)

ii.) Determine the critical path and project duration. (4 marks)

3. (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:**

i) Formulate the problem as a liner programming problem. (5 marks)

ii.) Write the problem in a standard form (5 marks)

4. a) Discuss any five advantages of the reorder level system in managing inventories

(10 marks)

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b) Biashara Enterprises Ltd is a company that consumes 10,000 units of a product per annum. The consumption of the product is fairly constant throughout the year. The cost of the item is ksh 120 when purchased in large quantities. The cost of placing and receiving the order is ksh 300. It takes on average 45 days to receive delivery from the date of the order. The carrying cost is estimated to be 20% of the average inventory.

**Required:**

Calculate

- (i) The economic order quantity (6 marks)
  - (ii) The number of order per year (4 marks)
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