

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS.

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COMMERCE

BCOM 272/263: OPERATIONS RESEARCH I

STREAMS: BCOM Y2S2

TIME: 2 HOURS

DAY/DATE: TUESDAY 18/12/2018

11.30 A.M - 1.30 P.M

INSTRUCTIONS:

- Answer Question ONE and any other TWO Questions.

- (a) Discuss any **FIVE** advantages of using models to solve business problems. (10 Marks)
 - (b) Discuss Five Benefits of using computers in solving Operations research problems (10 Marks)
 - (c) What are the limitations of Operations Research? (10 Marks)
- A manager of a computer servicing company has obtained five jobs to be done immediately. He has selected five of his best technicians to do the job. The time in minutes that each of the five technicians can take to complete each job is as shown in the table below;

TECHNICIAN	JOBS				
	A	B	C	D	E
1	130	137	140	158	140
2	140	124	127	121	136
3	140	132	133	130	135
4	125	138	140	136	136
5	129	162	141	134	139

RequiredAssign the **technicians** the different jobs so as to minimize the time of doing the jobs

Marks)

(10

2(a) Discusses any Five objectives of inventory management and control (10 Marks)

(b) The following data relates to component K₁₀

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

Calculate

- (i) The reorder level
- (ii) The minimum stock level
- (iii) The average stock level (10 Marks)

3 (a) Discuss any Five benefits of using networks in project management (10 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 Days</u>
A	-	9
B	-	4
C	-	7
D	B, C	8
E	A	7
F	C	5
G	E	10
H	E	8
I	D, F, H	6
J	E	9
K	I, J	10
L	G	2

Required

(i) Draw a Network diagram for the project (5 Marks)

(ii) Determine the critical path and the project duration (5 Marks)

4 (a) State and explain any Five benefits of using Linear Programming technique in solving business problems (10 Marks)

(b) A production line can be set to produce either product B or C. The table below shows the details of the products

Products	Labour (Min)	Materials (Kgs)	Testing (Min)
B	60	4	6
C	30	8	8

BCOM 272/263

In a week only 50 hours of labour and 560Kgs of material are available. Owing to the cost and availability the testing equipment must be used for at least 10 hours. The current orders require at least 20 units of product B. Contribution from each unit of B is Sh 24 and each unit of product C is Sh 24.

Required

Formulate the problem as a linear programming model and show the feasible region (10 Marks)

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