

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

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

BCOM 263: OPERATIONS RESEARCH I

STREAMS: BCOM (ODEL)

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 15/04/2020

8.30 A.M. – 10.30 A.M.

INSTRUCTIONS: Answer question ONE and any other TWO questions

1. (a) Give five benefits of using models in showing operation research process [10 marks]
- (b) What are the steps in solving operations research process [10 marks]
- (c) A construction company has identified the following activities for a project

Activity	Proceeding activity	Duration in months
A	-	8
B	-	10
C	-	9
D	A, B	12
E	B, C	9
F	C	11
G	C	16
H	E, F, D	14
I	D	13

Required:

- (i) Draw a network diagram for the project [6 marks]
- (ii) Determine the critical path and project duration [4 marks]

BCOM 263

2. (a) State and explain any five benefits of using the reorder level method in controlling

(b) The following data relates to the usage of a particular stock item

Maximum consumption 12000 units per week

Normal consumption 9000 units per week

Minimum consumption 6000 units per week

Reorder period 4 – 6 weeks

Reorder quantity 60,000 units

Calculate

- (i) Reorder level [3 marks]
- (ii) Maximum stock level [2 marks]
- (iii) Minimum stock level [2 marks]
- (iv) Average stock level [3 marks]

3. (a) Explain the steps in solving the assignment problems using the Hungarian method

(b) A company sells its goods in four countries A, B, C, D. the company has four sales agents I, II, III and IV. The costs incurred by the four agents is thousands of Kenya shillings and as shown below

	centre			
Agents	A	B	C	D
I	10	25	15	14
II	12	23	19	12
III	14	20	18	11
IV	13	20	17	13

Required:

Determine the optimal assignment that will minimize costs by assigning each agent only one county

marks]

[10

BCOM 263

4. (a) State and explain the five assumptions in solving the linear programming problems [10

marks]

(b) A company manufactures two products A and B. To manufacture one unit of product A requires one and half hours of machine time and two hours of the craftsman. To manufacture one unit of product B requires two and half hours machine time and one and half hours of the craftsman. At the moment only 80 hours of machine time and 70 hours of the craftsman time is available. Each of products A is sold at ksh. 50 and for B ksh 40. All what is produced is sold immediately.

Required

- (i) Formulate the problem as a linear programming [4 marks]
- (ii) Write the problem in standard form [2 marks]
- (iii) Give two weaknesses of the graphical method in solving linear programming problem [4 marks]