CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

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

BCOM 263: OPERATIONS RESEARCH I

STREAMS: BCOM (Y2S2)   **TIME: 2 HOURS**

DAY/DATE: WEDNESDAY 06/12/2017   2.30 P.M. – 4.30 P.M.

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

1. (a) Solving operations research problems involve several systematic steps. Discuss the steps.   [10 marks]

    (b) What are the limitations of using operations research techniques to solve business problems.   [10 marks]

    (c) A company employs services engineers that are based at various locations throughout the country to service and repair their equipment installed in customerspremises. The distance between the engineer's locations and their customers is as shown below

		Customer distance			
		W	X	Y	Z
Engineers	A	25	18	23	14
	B	38	15	53	23
	C	15	17	41	30
	D	26	28	36	29

Required:

Assign the engineers to respective customers so as to minimize the total distance to be travelled. [10 marks]

2. (a) Discuss any five benefits of using the reorder level system in managing, inventories. [10 marks]

(b) A company uses 9000 units of an item per year. The annual holding cost is estimated to be 9% on the average inventory. The orderly cost per order is kshs. 400. The item cost price is sh. 20.

Required:

(i) Economic Order Quantity

(ii) Number of orders per year

(iii) Annual stock holding costs [10 marks]

3. (a) Give five differences between CPM and PERT technique of project management. [10 marks]

(b) A project consists of the followingactivities

Activity	Proceedingactivity	Activity duration (days)
A	-	4
B	-	5
C	A	2
D	A	3
E	B, C	3
F	B, C	4
G	D, E	5
H	F	2

Required:

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

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

4. (a) State and explain the requirements that are necessary in using the linear programming technique in solving problems. [8 marks]

(b) A firm produces the products X and Y. The profit contribution per product is ksh

8 and ksh 10 for X and Y respectively. The production data per unit is as follows

Product	Labour hours	Material A units	Material units
X	3	4	6
Y	5	2	8

There are 500 labour hours available, 350 units of material A and 800 units of material B available

Required:

(i) Formulate the problem as a linear programming problem   [5 marks]

(ii) Write the problem in standard form.   [3 marks]

(iii) Determine the entering variable, leaving variable and the pivot element.

[4 marks]