CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

SECOND YEAR EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF COOPERATIVE MANAGEMENT

BCOM 263: OPERATIONS RESEARCH

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

DAY/DATE: MONDAY8/8/2016 **8.30 A.M. – 10.30 A.M.**

INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

1. (a) Discuss any five limitations of using models to solve business problems. [10 marks]

(b) Discuss the limitations of using operations research techingsto solve problems. [10 marks]

(c) Four jobs are to be allocated four machines. The following table shows the time that each machine can take to complete a job in hours

		Machine time in hours			
Jobs		1	2	3	4
	A	5	13	4	10
	B	15	3	10	8
	C	12	4	8	9
	D	2	11	14	5

Required:

Allocate the jobs to machines in an optimal manner. [10 marks]

2. (a) Discuss any limitations of the economic order quantity model (EOQ) in managing inventories. [5 marks]

(b) A company has provided the following data in respect of its major raw material.

Maximum consumption	12000 units per week
Normal consumption	9000 units per week
Minimum consumption	6000 units per week
Re-order period	4-6 weeks
Re-order quantity	60,000

Required:

(i) Re-order level [5 marks]

(ii) Minimum stock [3 marks]

(iii) Maximum stock [3 marks]

(iv) Average stock [4 marks]

3. (a) Discuss any five benefits of using networks to manage projects. [5 marks]

(b) A project consists of the following activities

Activity	Preceding activity	Duration in weeks
A	-	7
B	-	10
C	A	4
D	A	30
E	A	7
F	B, C	12
G	B, C	15
H	E, F	11
I	E, F	25
J	E, F	6
K	D, H	21
L	G, J	25

Required:

(i) Draw a network diagram for the project. [8 marks]

(ii) Determine the critical path and project duration. [5 marks]

(iii) Determine the total float for activity G. [2 marks]

4. (a) Using suitable examples in a Kenyan business environment, distinguish between cooperative and non-cooperative games. [5 marks]

(b) Discuss the principles of dominance as used in game theory. [5 marks]

(c) A company produces three products X, Y and Z. each of the products goes through three processes namely A, B and C in that order. The amount of time in minutes each unit ofthe product spends in the various processes are given in hours in the table below:

		Processes		
Product		A	B	C
	X	2	3	5
	Y	3	1	2
	Z	4	2	1

The maximum time available in process A, B and C are 125, 95 and 140 hours respectively. The products X, Y and Z have a profit contribution of ksh 5, 8 and 6 respectively.

Required:

(i) Formulate the problem as a linear programming problem. [4 marks]

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

(iii) Show the entering variable, leaving variable and pivot element. [3 marks]
