

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS
CHUKA/EMBU/THARAKA**

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

BCOM 263: OPERATION RESEARCH 1**STREAMS: Y2S2****TIME: 2 HOURS****DAY/DATE: WEDNESDAY 4/12/2019****11.30 A.M – 1.30 P.M****INSTRUCTIONS****Answer question one and any other two questions**

1. (a) Discuss any five benefits of using operations research models to solve business problems. [10 marks]
- (b) State and explain the Limitations of using operations research techniques in Kenya. [10 marks]
- (c) The production department of kappa oil ltd has machines that do any of the required jobs with different costs of doing the jobs. The following table shows the time in minutes that each machine will take to do the jobs.

Jobs					
Machine	A	B	C	D	E
1	60	20	50	30	60
2	20	50	80	70	70
3	70	80	60	90	80
4	60	20	30	40	50
5	90	30	80	90	70
6	40	70	40	60	80

Each machine is allocated only one job to do at a time.

Required ;

Assign each machine one job in an optimal manner. [10 marks]

2. (a) Explain any four benefits of using network models in managing projects. [8 marks]

(b) A construction projects has been broken down into the following activities;

Activity	Proceeding activity	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 . [6 marks]
- (ii) Determine the critical path and project duration. [4 marks]
- (iii) What is the total float for activity G. [2 marks]
3. (a) Give any four benefits of using the reorder level system in managing inventories. [8 marks]
- (b) Discuss any four assumptions in calculating the economic order quantity.[8 marks]
- (c) A company sells approximately 9,600 units an item per year. The annual carry costs per item is 16% and the ordering cost is ksh 75. The basic price per unit is ksh 10 and the lead time is 5 days . The company operates on 288 days per year.

Required:

Calculate the economic order quantity. [4 marks]

4. (a) Using suitable examples distinguish between cooperative and non cooperative games.

[8 marks]

(b) A company produces three products A,B and C. The unit contribution of the products are ksh 5,10 and 8 respectively. Each unit of product A requires 3 kgs of material 4 machine hours and 2 hours of labour time each unit product B requires 5kg of material, 4 machine hours and 4 labour hours and each unit of product C requires 2kg of materials, 4 machine hours and 5 labour hours. The company has 60 kgs of materials 72 machine hours and 100 labor hours available in the current production period.

Required :

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

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

(iii) Draw the initial simplex and show the Entering Variable Leaving Variance and the Pivot Element tableau. [4 marks]