

**SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN  
(AUTONOMOUS)**

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)  
Chromepet, Chennai — 600 044.

**B.Com.(ISM) END SEMESTER EXAMINATIONS APRIL-2022**

**SEMESTER - II**

**20UBIAT2002 - Operations Research**

**Total Duration : 3 Hrs.**

**Total Marks : 60**

**Section A**

Answer any **SIX** questions ( $6 \times 5 = 30$  Marks)

1. List out the scope of operations research.
2. Solve the following LP problem graphically.  
Maximize:  $Z = 20X_1 + 10X_2$   
Subject To Constraints:  $10X_1 + 5X_2 \leq 50$ ;  $6X_1 + 10X_2 \leq 60$ ;  $4X_1 + 12X_2 \leq 48$ ;  
 $X_1, X_2 \geq 0$
3. Five men are available to do five different jobs. From past records, the time (in hours) that each man take to do each job is known and given:

	JOB- I	JOB -II	JOB- III	JOB -IV	JOB -V
<b>MEN- A</b>	2	3	2	7	1
<b>MEN –B</b>	6	8	7	6	1
<b>MEN –C</b>	4	6	5	3	1
<b>MEN –D</b>	4	2	7	3	1
<b>MEN –E</b>	5	3	9	5	1

Find the assignment of men to jobs that will minimize the total time taken.

4. Distinguish between CPM and PERT.
5. The duration and requirement of work force for each activity is tabulated below.  
Construct the network diagram and find critical path.

<b>Activity</b>	1-2	1-3	1-5	2-3	2-4	3-4	3-5	3-6	4-6	5-6
<b>Duration(days)</b>	8	7	12	4	10	3	5	10	7	4

6. Solve the following game using Dominance Property:

	<b>Player B</b>	
<b>Player A</b>	20	80
	40	30
	50	60

7. How does a decision tree help in arriving at decisions?
8. Give a brief account of the application of transportation problem.

**Contd...**

## Section B

Answer any **THREE** questions ( $3 \times 10 = 30$  Marks)

9. What are the advantages and disadvantages of operation research?
10. Use Simplex method to solve the following LPP:  
 Maximise:  $4x_1 + 10x_2 \leq \leq \geq$   
 Subject to the constraints:  
 $2x_1 + x_2 \leq 50$   
 $2x_1 + 5x_2 \leq 100$   
 $2x_1 + 3x_2 \leq 90$   
 $x_1, x_2 \geq 0$ .
11. Solve the following transportation problem using initial solution to minimise the total cost of transportation:

Destination					
	D1	D2	D3	D4	Supply
Origin 1	14	56	48	27	70
Origin 2	82	35	21	81	47
Origin 2	99	31	71	63	93
Demand	70	35	45	60	210

12. The following table indicates the details of a project. The duration are in days. 'a' refers to Optimistic time, 'm' refers to most likely time and 'b' refers to pessimistic time duration:

activity	1-2	1-3	1-4	2-4	2-5	3-5	4-5
a	2	3	4	8	6	2	2
m	4	4	5	9	8	3	5
b	5	6	6	11	12	4	7

- a) Draw the network;  
 b) Find the critical path;  
 c) Determine the expected standard deviation of the completion time.
13. Solve the following game using Dominance Property:

	Player B			
Player A	1	7	3	4
	5	6	4	5
	7	2	0	3

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