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.Sc.Statistics - END SEMESTER EXAMINATIONS - APRIL 2025
SEMESTER - IV
20USTCT4008 - Operations Research

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

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

1. Solve the LPP by using graphical method:
   Max $Z = 5x_1 + 3x_2$
   Subject to $3x_1 + 5x_2 \leq 15$
   $5x_1 + 2x_2 \leq 10$ and $x_1, x_2 \geq 0$
2. List out the step by step algorithm for North West Corner rule of Transportation Problem.
3. Describe the procedure for Hungarian Method.
4. Solve the following 2 x 2 game:

		Player B
Player A	5	1
	3	4

5. Sketch the network for the corresponding given data:

Activity	A	B	C	D	E	F	G	H	I	J	K
Predecessor	-	-	-	A	C	B,D	B,D	E,F	A	G	E,F

6. Five jobs are to be performed, first on Machine X and then Machine Y. The time taken, in hours by each job on each Machine is given below:

Jobs	A	B	C	D	E
Time on Machine X	12	4	20	14	22
Time on Machine Y	6	14	16	18	10

   Compute the Sequencing and Total time elapsed.
7. Mention the Limitations of Linear Programming Problem.
8. Evaluate the TP by Least Cost method.

					Demand
	5	4	2	6	20
	8	3	5	7	30
	5	9	4	6	50
Supply	10	40	20	30	

Contd...

Section C

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

9. Explain the Phases of OR.

10. Determine the optimal Transportation Cost.

					Demand
	2	3	11	7	6
	1	0	6	7	1
	5	8	15	9	10
Supply	7	5	3	2	

11. Solve the following Assignment Problem:

	I	**II**	**III**	**IV**
A	42	35	28	21
B	30	25	20	15
C	30	25	20	15
D	24	20	16	12

12. Using graphical method, solve the rectangular game whose pay off matrix for player:

$$\begin{array}{c} \\ \textbf{Player A} \end{array} \begin{array}{c} \textbf{Player B} \\ \begin{pmatrix} 2 & -1 & 5 & -2 & 6 \\ -2 & 4 & -3 & 1 & 0 \end{pmatrix} \end{array}$$

13. A project schedule has the following characteristics. Calculate the Expected duration of each activity and draw the network. Also determine the critical path and total duration of the project.

Activity	**Most likely time**	**Optimistic time**	**Pessimistic time**
1 - 2	2	1	3
2 - 3	2	1	3
2 - 4	3	1	5
3 - 5	4	3	5
4 - 5	3	2	4
4 - 6	5	3	7
5 - 7	5	4	6
6 - 7	7	6	8
7 - 8	4	2	6
7 - 9	6	4	8
8 - 10	2	1	3
9 - 10	5	3	7

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