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.(BIM) END SEMESTER EXAMINATIONS NOVEMBER -2023
SEMESTER - II
21UBBAT2002 - Elements of Operations Research

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

Section B

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

1. Enumerate the characteristic of operation Research.
2. What are the steps involved in Vogel's Approximation method?
3. The following are the characteristics of a project.

Activity	**Immediate Predecessors**	**Duration in days**
A	-	2
B	A	3
C	A	4
D	B,C	6
E	-	2
F	E	8

Draw the network diagram for the above project.

4. For the game with payoff matrix.

	Player B		
Player A	$\mathbf{B_1}$	$\mathbf{B_2}$	$\mathbf{B_3}$
$\mathbf{A_1}$	-1	2	-2
$\mathbf{A_2}$	6	4	-6

Determine the optimal statergies for player A and B. Also determine the value of game.

5. Solve the following LPP by graphical method
Max $Z=30x_1+20x_2$
Subject to $2x_1+x_2 \leq 800$,
$x_1+ 2x_2 \leq 1000$ and
$x_1, x_2 \geq 0$

Contd...

6. Solve the following assignment problem

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

7. Draw a Network diagram for the following project and find its critical path

Activity	1-2	1-3	2-3	2 – 4	3 – 4	4-5
Duration(days)	20	25	10	12	6	10

8. Solve the following game $\begin{pmatrix} 3 & -2 \\ -2 & 5 \end{pmatrix}$

Section C

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

9. Discuss in detail about application and limitations of "Operation Research".
10. Solve the following LPP by simplex method
    Max $Z=21x_1+15x_2$
    Subject to $x_1+2x_2 \leq 6$
    $4x_1+3x_2 \leq 12$ and $x_1, x_2 \geq 0$
11. Solve the following transportation problem by using VAM.

	W	**X**	**Y**	**Z**	**Supply**
P	190	300	500	100	70
Q	700	300	400	600	90
R	400	100	600	200	180
Demand	50	80	70	140	340

12. Construct the network and find the critical path and project duration using PERT calculation for the following project in days

Job	**Predecessors**	$\mathbf{t}_o$	$\mathbf{t}_m$	$\mathbf{t}_p$
A	-	2	5	8
B	A	6	9	12
C	A	6	7	8
D	B,C	1	4	7
E	A	8	8	8
F	D,E	5	14	17
G	C	3	12	21
H	F,G	3	6	9
I	H	5	8	11

13. Solve the following game by Graphical method.

	$\mathbf{B}_1$	$\mathbf{B}_2$
$\mathbf{A}_1$	-6	7
$\mathbf{A}_2$	4	-5
$\mathbf{A}_3$	-1	-2
$\mathbf{A}_4$	-2	5
$\mathbf{A}_5$	7	-6

*****