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. PA - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER - VI
21UPACT6018 - Operations Research

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

Section B

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

1. Explain the significant features of Operations Research.
2. Explain the advantages of Linear Programming and its limitations.
3. Compute an initial basic feasible solution to the following transportation problem using the north-west corner rule:

Origin	**Destination**			**Supply**
P	6	4	9	200
Q	10	5	8	175
R	12	7	6	75
Demand	250	100	150	

4. For the game with the following payoff matrix, compute the optimum strategies and the value of the game:

$$\begin{bmatrix} 5 & 1 \\ 3 & 4 \end{bmatrix}$$

5. Explain the four basic assumptions in LPP.
6. Determine the graphical solution method.
7. Compute an initial basic feasible solution to the following transportation problem using the Least-cost method:

	D_1	**D_2**	**D_3**	**Capacity**
W_1	5	4	3	6
W_2	4	7	6	8
W_3	2	5	8	12
W_4	8	6	7	4
Demand	8	10	12	

Contd...

8. Determine whether the following two-person zero-sum game are strictly determinable and fair. Give optimum strategies for each player.

Player B

Player A $\begin{bmatrix} 5 & 0 \\ 0 & 2 \end{bmatrix}$

Section C

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

9. Discuss about the applications of OR in detail.

10. A company has three operational departments (weaving, processing, and packing) with capacity to produce three different types of clothes namely suitings, shirtings and woollens yielding a profit of Rs.2, Rs.4, and Rs.3 per metre respectively. One metre of suiting requires 3 minutes in weaving, 2 minutes in processing and 1 minute in packing. Similarly one metre of shirting requires 4 minutes in weaving, 1 minute in processing and 3 minutes in packing. One metre of woollen requires 3 minutes in each department. In a week, total run time of each department is 60, 40 and 80 hours for weaving, processing and packing respectively. Formulate the linear programming problem to find the product mix to maximize the profit.

11. Determine the solution for the following LPP using graphical method:
Maximize $z = 4x_1 + 3x_2$
subject to the constraints
$2x_1 + x_2 \leq 1000$,
$x_1 + x_2 \leq 800$,
$x_1 \leq 400$ and $x_2 \leq 700$.
$x_1 \geq 0$, and $x_2 \geq 0$.

12. Use Vogel's approximation method to compute an initial basic feasible solution of the transportation problem:

	D	**E**	**F**	**G**	**Available**
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand	200	225	275	250	

13. Solve the following 2×2 game graphically

Player B

Player A		B_1	B_2	B_3	B_4
	A_1	2	1	0	- 2
	A_2	1	0	3	2

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