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.(Computer Science) END SEMESTER EXAMINATIONS NOVEMBER -2023
SEMESTER - V
21UCSET5RT1 - Resource Management Techniques

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

Section B

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

1. A Machine producing either product A or B can produce A by using 2 units of chemicals and 1 unit of a compound and can produce B by using 1 unit of chemicals and 2 units of the compound. Only 800 units of chemicals and 1000 units of the compound are available. The profits available per unit of A and B are respectively Rs.30 and Rs.20. Draw a suitable diagram to show the feasible region. Also, find the optimum allocation of units between A and B to maximise the total profit. Find the maximum profit.

2. Solve the Transportation Problem by Vogel's Approximation Method

Requirements	Availability S1	S2	S3	Ai
W1	5	4	2	6
W2	4	7	6	8
W3	2	5	8	12
W4	8	6	7	4
Bj	8	10	12	30

3. Explain the Basic Terms used in Sequencing.

4. Determine the PERT and CPM Computation in detail.

5. Compute the Optimal solution for the assignment problem with the following cost matrix

Area

Salesman	W	X	Y	Z
A	11	17	8	16
B	9	7	12	6
C	13	16	15	12
D	14	10	12	11

6. Classify the Characteristic of games in detail.

Contd...

7. Solve the following Game:

$$\text{Player A} \quad \begin{matrix} & \text{Player B} \\ \begin{bmatrix} 3 & -2 \\ -2 & 5 \end{bmatrix} \end{matrix}$$

8. The Marketing department of Everest company has collected information n the problem of advertising for its products. This relates to the advertising media the maximum availability of each medium ad the expected exposure of each one (Measured as the relative value of one advertisement in each of the media)

The information is given as under:

Advertising Media exposure (units)	No.of families To cover	Cost/ad (Rs.)	Maximum availability Expected (No.of times)
TV (30 sec) 80	3000	8,000	8
Radio(15 sec) 20	7000	3,000	30
Sunday Edition (1/4 page) 50	5000	4,000	4
Magazine (1 page) 60	2000	3,000	2

Other information and requirements:
(a) The advertising budget is Rs.70000
(b) At least 40000 families should be covered
(c) At least 2 insertions be given in Sunday edition of daily but not more than 4 advertisements should be given on the TV.

Convert this as a linear programming problem. The company's objective is to maximize the expected exposure.

Section C

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

9. Solve the following LPP by Simplex Method.

Maximize $z = 2x_1 + 3x_2$
subject to $-x_1 + 2x_2 \leq 4$,
$x_1 + 2x_2 \leq 6$,
$x_1 + 3x_2 \leq 9$,
$x_1, x_2 \geq 0$

Contd...

10. Solve the Transportation Problem

	A	B	C	ai
F1	10	9	8	8
F2	10	7	10	7
F3	11	9	7	9
F4	12	14	10	4
Bj	10	10	8	

11. In a Factory, there are six jobs to perform, each of which should go through two machine A and B in the order A, B. The Processing timings (in hours) for the jobs are given here. You are required to determine the sequence for performing the jobs that would minimize the total elapsed time, T . What is the value of T?

Job:	J1	J2	J3	J4	J5	J6
Machine A:	1	3	8	5	6	3
Machine B:	5	6	3	2	2	10

12. Evaluate the following Game by algebraic and graphical method.

$$\text{Player A} \quad \begin{bmatrix} 3 & -1 & 1 & 2 \\ -2 & 3 & 2 & 3 \\ 2 & -2 & -1 & 1 \end{bmatrix}$$

Player B

13. Determine the PERT NETWORK for the following project and determine the critical path and project duration

Activity	Duration in days	Immediate Predecessors
A	4	none
B	1	none
C	1	A
D	1	B
E	6	C
F	8	E
G	2	F
H	4	F
I	1	G
J	5	H,I
K	5	D,G
L	2	K

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