

Yashwantrao Chavan College of Science, Karad

Department of Computer Science

Question Bank, 2023-2024

Subject: Mathematics (Operation Research)

Class: B.Sc. CS. (Entire) - II

1) Solve the following L.P.P. using simplex method.

$$\text{Max } Z = 2x_1 - x_2 + 2x_3$$

$$\text{Subject to } 2x_1 + x_2 \leq 10$$

$$x_1 + 2x_2 - 2x_3 \leq 20$$

$$x_1 + 2x_3 \leq 5$$

2) Solve the following L.P.P. by Big- M method.

$$\text{Min } Z = 12x_1 + 20x_2$$

$$\text{Subject to } 6x_1 + 8x_2 \geq 100$$

$$7x_1 + 12x_2 \geq 120$$

3) Solve the following problem by using VAM method.

	W_1	W_2	W_3	W_4	Supply
O_1	19	30	50	10	7
O_2	10	30	40	60	9
O_3	40	8	70	20	18
Demand	5	8	7	14	

4) Solve the following using unbalanced assignment problem.

	P	Q	R
A	7	3	5
B	2	7	4
C	6	5	3
D	3	4	7

5) Define : (i) Slack variable (ii) Surplus variable

6) To solve transportation problem by using matrix minima method.

	D_1	D_2	D_3	D_4	Supply
O_1	19	30	30	10	7
O_2	10	30	40	60	9
O_3	40	8	70	20	18

7) Solve the following game by arithmetic method.

	Player B	
	I	II
Player B	[5	3 1 4]

8) To find minimum cost of transportation problem by using North- west corner method.

	W_1	W_2	W_3	W_4	Supply
F_1	1	2	1	4	30
F_2	2	3	2	1	50
F_3	4	4	5	9	20
Demand	20	40	30	10	

9) Solve the following assignment problem for minimum cost by using Hungarian method.

	I	II	III	IV
A	15	13	14	17
B	11	12	15	13
C	13	12	10	11
D	15	17	14	16

10) Solve the following L.P.P. by Simplex method.

$$\text{Max } Z = 3x_1 + 2x_2 + 5x_3$$

$$\text{Subject to } x_1 + 2x_2 + x_3 \leq 430$$

$$3x_1 + 2x_3 \leq 460$$

$$x_1 + 4x_2 \leq 430$$

11) To find minimum cost of transportation problem by using North- west corner method.

	W_1	W_2	W_3	W_4	Supply
F_1	2	16	15	13	11
F_2	17	18	14	23	13
F_3	13	27	18	41	19
Demand	6	10	12	15	43

12) Solve the following problem by using VAM method.

	W_1	W_2	W_3	W_4	Supply

O_1	11	13	17	14	250
O_2	16	18	14	10	300
O_3	21	24	13	10	400
Demand	200	225	275	250	950

13) Solve the following problem by using MODI method.

	W_1	W_2	W_3	W_4	Supply
O_1	2	16	15	13	11
O_2	17	18	14	23	13
O_3	32	27	18	41	19
Demand	6	10	12	15	

14) Solve the following game by arithmetic method.

	Player B	
	I	II
Player B	[4	1 2 5]

15) Solve the following assignment problem for minimum cost by using Hungarian method.

	I	II	III	IV
A	2	10	9	7
B	15	4	14	8
C	13	14	16	11
D	4	15	13	9

16) To solve transportation problem by using matrix minima method.

	D_1	D_2	D_3	D_4	Supply
O_1	11	13	17	14	250
O_2	16	18	14	10	300
O_3	21	24	13	10	400
Demand	200	225	275	250	950

17) Obtain the initial basic feasible solution for the following transportation problem by VAM method to maximize the profit of following rates.

	D_1	D_2	D_3	D_4	Supply
O_1	15	51	42	33	23
O_2	30	42	26	81	44
O_3	90	40	66	50	33
Demand	23	31	16	30	100

18) Solve the following assignment problem for minimum cost by using Hungarian method.

	I	II	III	IV
A	4	2	5	7
B	8	3	10	8
C	12	5	4	5
D	6	3	7	14

19) Solve the following problem by using MODI method.

	W_1	W_2	W_3	W_4	Supply
O_1	11	13	17	14	250
O_2	16	18	14	10	300
O_3	21	24	13	10	400
Demand	200	225	275	250	950

20) Obtain the initial basic feasible solution for the following transportation problem by VAM method to maximize the profit of following rates.

	D_1	D_2	D_3	D_4	Supply
O_1	30	25	40	20	100
O_2	29	26	35	40	250
O_3	31	33	37	30	150

Demand	90	160	200	50	500
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21) To find minimum cost of transportation problem by using North- west corner method.

	A	B	III	IV
1	6	10	15	2
2	4	6	16	5
3	12	5	8	9
Demand	1	8	7	16

22) To solve transportation problem by using matrix minima method.

	W_1	W_2	W_3	W_4	Supply
F_1	2	16	15	13	11
F_2	17	18	14	23	13
F_3	13	27	18	41	19
Demand	6	10	12	15	43

23) Solve the following problem by using VAM method.

	W_1	W_2	W_3	W_4	Supply
F_1	2	16	15	13	11
F_2	17	18	14	23	13
F_3	13	27	18	41	19
Demand	6	10	12	15	43

24) Solve the following problem by using MODI method.

	W_1	W_2	W_3	W_4	Supply
O_1	19	30	50	10	7
O_2	10	30	40	60	9
O_3	40	8	70	20	18
Demand	5	8	7	14	

25) Solve the following assignment problem for minimum cost by using Hungarian method.

	I	II	III
A	470	580	410
B	365	920	740
C	880	550	430