

**S.Y.B.SC. (COMPUTER SCIENCE) SEM –IV (2014 COURSE) :**

**SUMMER - 2018**

**SUBJECT : OPTIMIZATION TECHNIQUES**

Day: **Thursday**  
Date: **19/04/2018**

**S-2018-0852**

Time: **03.00 PM TO 05.00 PM**  
Max. Marks: 40

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate full marks.

**Q.1** Attempt **ANY TWO** of the following: **[10]**

- a) Use Big – M method to solve the following L.P.P

$$\text{Max } Z = 3x - y$$

Subject to,

$$2x + y \geq 2$$

$$x + 3y \leq 3$$

$$y \leq 4$$

$$x, y \geq 0$$

- b) Solve following L.P.P. by graphically

$$\text{Maximize } Z = 50x + 8y$$

Subject to,

$$x \leq 80$$

$$y \leq 60$$

$$5x + 6y \leq 600$$

$$x + 2y \leq 160$$

$$x, y \geq 0$$

- c) Solve the following transportation problem by matrix minima method.

	W1	W2	W3	W4	Supply
F1	30	25	40	20	100
F2	29	26	35	40	250
F3	31	33	37	30	150
Demand	90	160	200	50	500

**Q.2** Attempt **ANY TWO** of the following: **[10]**

- a) Explain north west corner method.
- b) Find initial basic feasible solution of the following transportation problem by Vogel's approximation method and optimize it using MODI method.

		DESTINATION			
		D1	D2	D3	Supply
Origin	O1	8	16	16	152
	O2	32	48	32	164
	O3	16	32	48	154
	Demand	144	204	82	

- c) Solve the following assignment problem

	I	II	III	IV	V
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	155	170	185
D	60	50	80	80	110
E	55	35	70	80	105

**Q.3** Attempt **ANY TWO** of the following: **[10]**

- a) A marketing manager has 5 salesmen and 5 sales district considering capacities of the salesmen and nature of districts, the marketing manager, estimates that sales per months (in 100 Rs.) for each salesman in each district would be as follows:

		Districts				
		A	B	C	D	E
Salesman	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

Find the assignment of salesman to district that will result in a maximum sale.

- b) Solve the following game by graphical method

		Player B			
Player A	1	3	-3	7	
	2	5	4	-6	

- c) Reduce the following game by dominance principle and solve it

		I	II	III
I	-4	6	3	
II	-3	-3	4	
III	2	-3	4	

**Q.4** Attempt **ANY FIVE** of the following: **[10]**

- a) Write dual of following L.P.P.

$$\text{Min } Z = x + 2y$$

Subject to,

$$-2x - 4y \geq -160$$

$$x - y \geq 30$$

$$x - y \leq 30$$

$$x \geq 10$$

$$x, y \geq 0$$

- b) Justify whether the following transportation problem is balanced, if no balanced it

	D1	D2	Supply
O1	10	15	20
O2	2	13	25
Demand	10	30	

- c) Write difference between transportation and assignment problem.

- d) Explain pay-off matrix.

- e) Solve the following assignment problem.

0	1	4
4	0	2
2	0	3

- f) Explain unbounded solution to L.P.P.

- g) Why following game is fair game?

		B		
A	-1	0	-3	
	2	1	0	
	3	2	1	

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