

S.Y.B.SC. (COMPUTER SCIENCE) SEM –IV (2014 COURSE) :
WINTER - 2017

SUBJECT : OPTIMIZATION TECHNIQUES

Day: Tuesday
Date: 31/10/2017

W-2017-0752

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) Write limitations of linear programming problem.

b) Solve the following L.P.P. by simplex method.

$$\text{Minimize } Z = x - 3y + 2z$$

Subject to,

$$3x - y + 2z \leq 7$$

$$-2x + 4y \leq 12$$

$$-4x + 3y + 8z \leq 10$$

$$x, y, z \geq 0$$

c) Solve the following L.P.P. by graphical method.

$$\text{Maximize } Z = 2x + 3y$$

Subject to,

$$x + y \geq 0$$

$$5x - y \geq 0$$

$$x + y \leq 6$$

$$x - 5y \leq 0$$

$$y - x \geq -1$$

$$y \leq 3$$

$$x, y \geq 0.$$

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

a) Explain matrix minima method .

b) Find initial basic feasible solution to transportation problem by Vogel's approximation method.

	D1	D2	D3	Supply
P1	9	6	0	5
P2	5	1	0	20
P3	3	2	4	10
P4	7	5	2	15
Demand	25	10	15	

c) Five Lathes are to be allocated to five operators (one for each). The following table which weekly outputs figures in pieces.

Weekly output lathes

		L1	L2	L3	L4	L5
Operators	P	20	22	27	32	36
	Q	19	23	29	34	40
	R	23	28	35	39	34
	S	21	24	31	37	42
	T	24	28	31	36	41

Profit per piece is Rs.25 ,Find the maximum profit.

Q.3 Attempt **ANY TWO** of the following:

[10]

a) Solve the following assignment problem .

		To				
		A	B	C	D	E
From	a	-	4	7	3	4
	b	4	2	6	3	4
	c	7	6	5	7	5
	d	3	3	7	6	7
	e	4	4	5	7	3

b) Reduce the following game by dominance principle and solve it.

		Player B				
		I	II	III	IV	V
Player A	I	1	3	2	7	4
	II	3	4	1	5	6
	III	6	5	7	6	5
	IV	2	0	6	3	1

c) Explain algebraic method for solving 2x2 game.

Q.4 Attempt **ANY FIVE** of the following:

[10]

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

$$\text{Max } Z = 3x + 4y$$

Subject to,

$$x - y \leq -1$$

$$-x + y \leq 0$$

$$x, y \geq 0$$

b) Explain maximization assignment problem.

c) Define: Transportation problem.

d) Define: Saddle point.

e) Explain the term optimal solution.

f) Determine whether the following assignment problem is balanced, if no balanced it..

		Jobs			
		I	II	III	IV
Operators	A	3	2	1	5
	B	3	1	7	8
	C	7	6	6	10

g) Consider the following pay-off matrix

$$\begin{bmatrix} 8 & 6 & 2 & 8 \\ 8 & 9 & 4 & 5 \\ 7 & 5 & 3 & 5 \end{bmatrix}$$

Determine saddle point ,if exist.

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