

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Marks are indicated in square brackets.

Q1.(a) Solve the LPP graphically $Max Z = 3x_1 + 2x_2$ [5]

$$s/t \ 5x_1 + 4x_2 \leq 200$$

$$3x_1 + 5x_2 \leq 150$$

$$5x_1 + 4x_2 \geq 100$$

$$8x_1 + 4x_2 \geq 80$$

$$x_1, x_2 \geq 0$$

(b) Find basic solution and basic feasible solution of system of equations [2]

$$2x_1 + 3x_2 - x_3 + 4x_4 = 8$$

$$x_1 - 2x_2 + 6x_3 - 7x_4 = -3$$

Q2.Find dual of the given LPP and use principle of duality to find the solution of [4]

$$Min Z = 3x_1 + 2x_2$$

$$s/t \ 7x_1 + 2x_2 \geq 30$$

$$5x_1 + 4x_2 \geq 20$$

$$2x_1 + 8x_2 \geq 16$$

$$x_1, x_2 \geq 0$$

Q3.Solve the assignment problem [3]

Machine/Jobs	A	B	C	D	E
1	2.5	5	1	6	1
2	2	5	1.5	7	3
3	3	6.5	2	8	3
4	3.5	7	2	9	4.5
5	4	7	3	9	6
6	6	9	5	10	6

Q4.Solve the Transportation problem

[7]

Source/Destination	1	2	3	Available
A	7	4	0	5
B	6	8	0	15
C	3	9	0	9
Requirement	15	6	8	

Q5.Solve the IPP using Gomory's method

$$\text{Max } Z = 4x_1 + 3x_2$$

[7]

$$\text{s/t } x_1 + 2x_2 \leq 4$$

$$2x_1 + x_2 \leq 6$$

$$x_1, x_2 \geq 0 \text{ and Integers}$$

Q6. Find the optimal sequence, elapsed time and Idle time for processing four jobs on 5 machines. The processing time is given as follows

[5]

Machines/Jobs	J1	J2	J3	J4
M1	6	5	4	7
M2	4	5	3	2
M3	1	3	4	2
M4	2	4	5	1
M5	8	9	7	5

Q7.What do you understand by CPM and PERT

[2]