

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-VII Semester (ECE)

COURSE CODE (CREDITS): 19B1WEC733 (3)

MAX. MARKS: 25

COURSE NAME: Optimization Techniques

COURSE INSTRUCTOR: Dr. Neel Kanth

MAX. TIME: 1 Hour and 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. Solve the LPP using Big M Method

[5][CO-1]

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

$$\text{s/t } 2x_1 + 2x_2 - x_3 \geq 2, \quad 3x_1 - 4x_2 \leq 3, \quad x_2 + 3x_3 \leq 5$$

$$x_1, x_2, x_3 \geq 0$$

Q2(a) Write the dual of the primal problem

[2][CO-2]

$$\text{Max } Z = 5x_1 + 12x_2 + 4x_3$$

$$\text{s/t } x_1 + 2x_2 + x_3 \leq 5, \quad 2x_1 - x_2 + 3x_3 = 2$$

$$x_1, x_2, x_3 \geq 0$$

(b) Solve the LPP using dual simplex method

[5][CO-2]

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

$$\text{s/t } x_1 + x_2 - x_3 \geq 5, \quad x_1 - 2x_2 + 4x_3 \geq 8$$

$$x_1, x_2, x_3 \geq 0$$

Q3. Write mathematical form of assignment problem.

[3][CO-2]

Q4. Solve the assignment problem

[5][CO-2]

Person/Job	1	2	3	4	5	6	7
A	35	20	60	41	27	52	44
B	51	39	42	33	65	47	58
C	25	32	53	41	50	36	43
D	32	28	40	46	33	55	49
E	43	36	45	63	57	49	42
F	27	18	31	46	35	42	34
G	48	50	72	59	43	64	58

Q5. Find basic feasible solution of the transportation problem using Vogel's approximation method

[5][CO-2]

Factory/Warehouse	W1	W2	W3	Supply
F1	2	7	4	5
F2	3	3	1	8
F3	5	4	7	7
F4	1	6	2	14
Demand	7	9	18	