

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2024

M.Tech-I Semester (SE)

COURSE CODE (CREDITS): 11M1WCE114(3)

MAX. MARKS: 35

COURSE NAME: Modelling Simulation and Computer Applications

COURSE INSTRUCTORS: Dr. Tanmay Gupta

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.1 Solve for optimal solution for the following transportation costs tableau

	1	2	3	4	Supply
1	5	9	--	4	28
2	6	10	3	--	32
3	4	2	5	7	60
Demand	48	29	40	33	

The – sign in cells (1, 3) and (2, 4) means that the transportation of product units is not possible between the corresponding origins and destinations. [8]

Q.2 Using Hungarian algorithm solve the following assignment problem [8]

6	12	3	11	15
4	2	7	1	10
8	11	10	7	11
16	19	12	23	21
9	5	7	6	10

Q.3 Explain with a suitable example concept of Two-person, zero-sum game? Explain all the methods for solving such problems. Solve the following game by graphical method – [6]

	B1	B2
A1	1	2
A2	5	4
A3	-7	9
A4	-4	-3
A5	2	1

Q.4 Shahi Export House has to process five items through three stages of production, viz, cutting, sewing & pressing. Processing times (hrs) are given in the following table: Determine an order in which these items should be processed so as to minimize the total processing time, also find out idle time of each machine, and show the sequence on grant chart? [6]

Item	Cutting	Sewing	Pressing
1	3	3	5
2	8	4	8
3	7	2	10
4	5	1	7
5	2	5	6

Q.5 Consider the following LPP

Maximize: $z = 2X_1 + 4X_2 + 3X_3$

Subjected to

$$X_1 + 3X_2 + 2X_3 = 20$$

$$X_1 + 5X_2 \geq 10$$

$$X_1, X_2, X_3 \geq 0$$

[4]

Taking x_1, s_2 as basic variables, find the Simplex tableau and verify it is the optimal tableau.

Basic	Z	X_1	X_2	X_3	R_1	S_2	R_2	Sol
Z								
X_1								
S_2								

Q.6 Two 10-meter-tall poles are 30 meters apart. A length of wire is attached to the top of each pole and it is staked to the ground somewhere between the two poles. Where should the wire be staked so that the minimum amount of wire is used?

[3]

