JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-VII Semester (ECE)

COURSE CODE(CREDITS): 19B1WEC733(3)   MAX. MARKS: 15

COURSE NAME: Optimization Techniques

COURSE INSTRUCTORS: Dr. Alok Kumar   MAX. TIME: 1 Hour

Note: (a)All questions are compulsory.

(b)Marks are indicated against each question in square brackets.

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

Q.1 List and explain the phases of the Operations Research approach. Provide examples for each phase.   **[CO1] [2 Marks]**

Q.2 Discuss the importance of modeling in Operations Research. Differentiate between deterministic and probabilistic models.   **[CO1] [2 Marks]**

Q.3 A plastic products manufacturer has 1,200 boxes of transparent wrap in stock at one factory and another 1,200 boxes at its second factory. The manufacturer has orders for this product from three different retailers, in quantities of 1,000, 700 and 500 boxes, respectively. The unit shipping costs (in rupees per box) from the factories to the retailers are as follows

	Retailer 1	Retailer 2	Retailer 3
Factory A	14	11	13
Factory B	13	13	12

Determine a minimum cost shipping schedule for satisfying all demands from current inventory. Formulate this problem as an LP model.   **[CO1,CO2] [3 Marks]**

Q.4 Use the graphical method to solve the following LP problem.
Minimize $Z = -x_1 + 2x_2$, subject to the constraints
(i) $-x_1 + 3x_2 \leq 10$ (ii) $x_1 + x_2 \leq 6$ (iii) $x_1 - x_2 \leq 2$ and $x_1 , x_2 \geq 0$
          [CO1] [4 Marks]

Q.5 You have just formulated a maximization LP problem and are preparing to solve it graphically. What criteria should you consider in deciding whether it would be easier to solve the problem by the extreme point enumeration method or the isoprofit line method.

[CO1] [2 Marks]

Q.6 What is an unbounded solution, and how is this condition recognized in the graphical method?

[CO1] [2 Marks]