

JK Lakshmipat University, Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY
End Term, December 2024
BCA, Semester III

Subject: **Data Structures (CS1102)**

Roll No.....

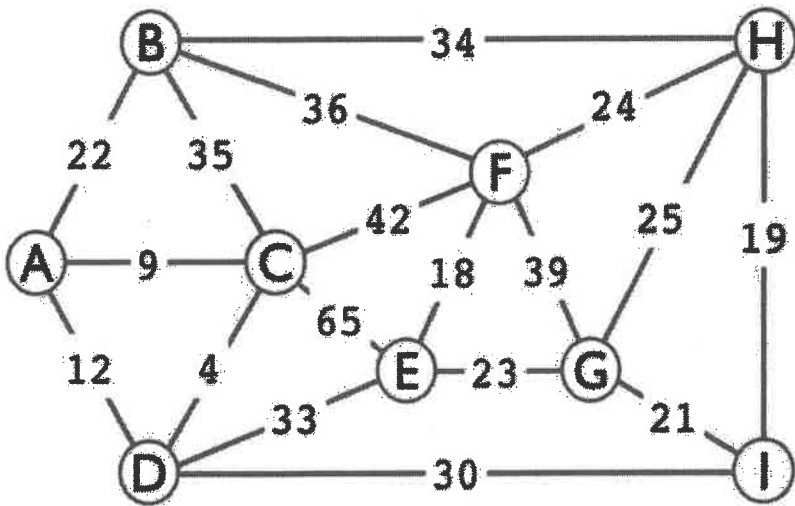
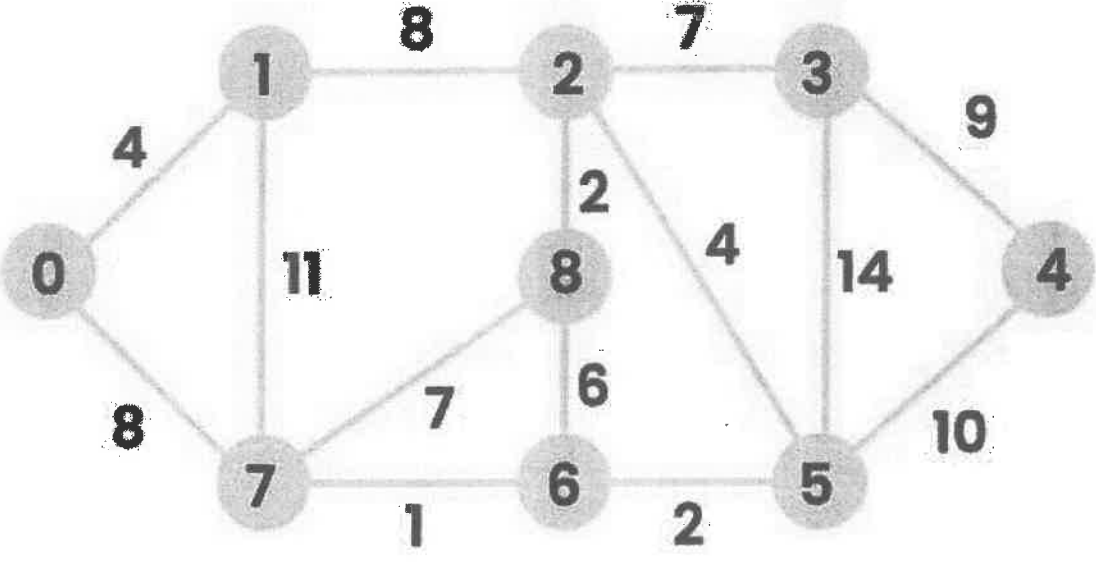
Time: 2:00 hours

Max. Marks: 30

Instructions to students:

1. Assume suitable data wherever required and mention it clearly.

Q.1	a. Construct an AVL Tree by inserting the following values in order: 50, 30, 70, 20, 40, 60, 80, 35. Show the tree after each insertion and explain the balancing steps. b. Construct a Binary Search Tree (BST) for the following sequence of numbers: 45, 25, 15, 75, 35, 85, 65, 40. i. Show the structure of the tree. ii. Delete the node with value 25 and explain the resulting tree structure.	6 CO3
Q.2	Given the following sequence of numbers: 38, 27, 43, 3, 9, 82, 10, 52, 75 a. Show the step-by-step process of sorting these numbers using Quick Sort. b. Use Merge Sort to sort the same sequence and compare the intermediate steps with Quick Sort.	6 CO4
Q.3	Given Infix Expression: $(A + B) * (C - D) / E$ (a) Construct the binary expression tree for the given infix expression. (b) Clearly label the operators as internal nodes and operands as leaf nodes in the tree. Write the following traversals of the constructed binary tree: (a) Preorder traversal (b) Postorder traversal	6 CO2, CO3

Q.4	Illustrate Dijkstra's Algorithm to find the shortest path in the following graph: 	6 CO5
Q. 5	Apply Prim's Algorithm and Kruskal's Algorithm to find the MST for the following graph: 	6 CO5

All the best