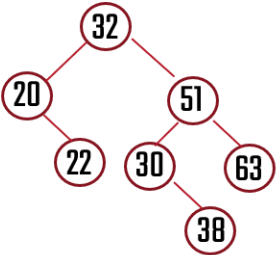
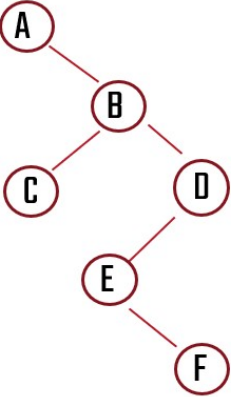
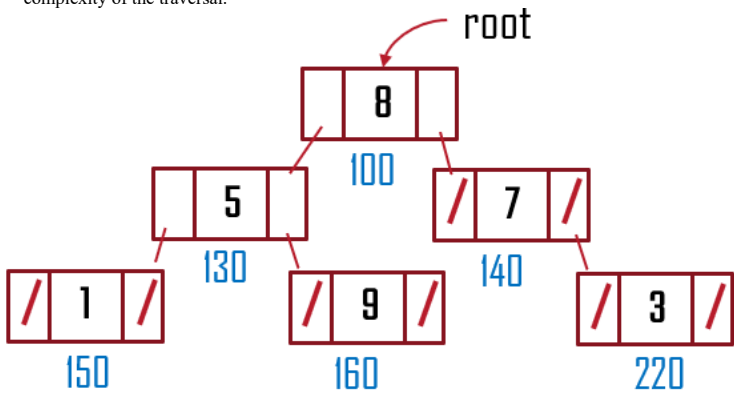
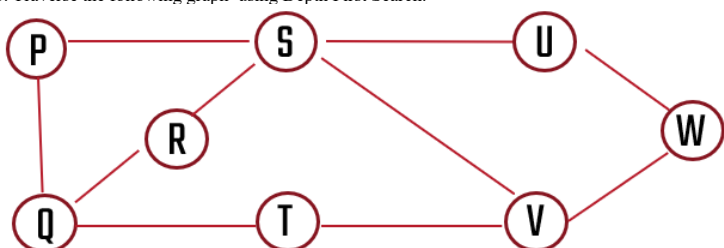
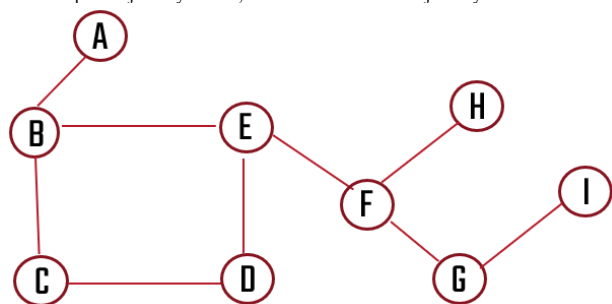




SOMAIYA
VIDYAVIHAR UNIVERSITY

Trim: Sep – Nov 24		
Maximum Marks: 50	Examination: ETE Exam	Date: 15-Jan 25 Duration: 2hrs
Programme code: 09 Programme: MCA	Class: FY	Semester: I
College: K. J. Somaiya Institute of Management	Name of the department: Data Science & Technology	
Course Code: 317P09C103	Name of the Course: Data Structures using Python	
Instructions: 1. First question is compulsory 2. Attempt Two questions out of Q2 to Q4 .		

Question No.		Max. Marks
Q1.	a. Analyze the time complexity of factorial numbers.	05
	b. Construct a Binary tree from Post-order and In-order traversal. Post-order: 9, 1, 2, 12, 7, 5, 3, 11, 4, 8 In-order: 9, 5, 1, 7, 2, 12, 8, 4, 3, 11	05
	c. For the given AVL tree, insert the keys {15, 29, 33, 32} one by one. Illustrate where these keys are added to the AVL tree and show the intermediate steps after each insertion, including any necessary rotations to maintain the AVL tree properties. 	05
	d. Given a set of the following numbers, build a heap and sort the array using heap sort method - 17, 12, 14, 10, 8, 9, 37, 18, 7	05
Q2.	a. Implement the insertion and deletion on singly linked list of following elements : 45, 20, 33, 21, 10	08
	b. Perform preorder, inorder, postorder, and level-by-level tree traversal for the following tree structure. 	07

Q3.	<p>a. Provide a code snippet for post-order traversal of the given tree structure. Additionally, trace the execution and analyze the space complexity of the traversal.</p> 	08
	<p>b. Traverse the following graph using Depth First Search:</p> 	07
Q4.	<p>a. Write a small code snippet for the insertion at given position and show the working of it in a Circular Linked list. (You have the freedom to determine the elements and position as well.)</p>	08
	<p>b. Prepare adjacency matrix, incidence matrix and adjacency list</p> 	07