Name:

Enrolment No:

UPES
End Semester Examination, December 2024

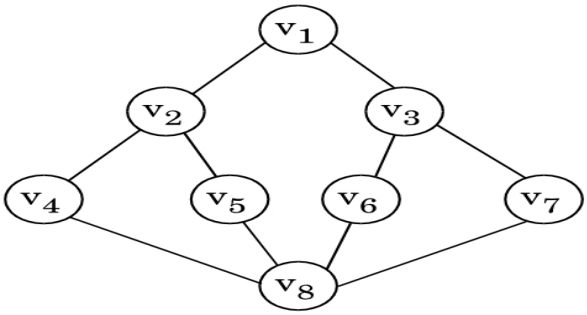
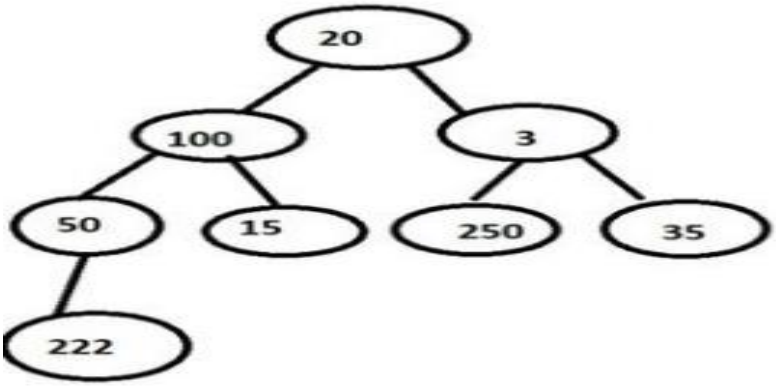
Course: Data Structure **Semester: III**
Program: Bachelor of Technology in Electronics & Computer Engg. **Time: 03 hrs.**
Course Code: CSEG2067 **Max. Marks: 100**
Instructions: Attempt all the questions as per the instruction.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1.	Discuss the difference between the array and link list with suitable example?	**4**	**CO1**
Q 2.	Discuss the difference between the Graph and Tree by using suitable example?	**4**	**CO5**
Q 3.	Write a code for finding the element in an array using linear search?	**4**	**CO1**
Q 4.	Find the equivalent prefix expression (A + B) * (C - D) / (E + F) - G	**4**	**CO3**
Q 5.	State the following i) Time complexity to traverse the link list ii) Time complexity for the worst case of binary search iii) Time complexity for the best case of linear search iv) Time complexity for best case of insertion sort	**4**	**CO2**

SECTION B
(4Qx10M= 40 Marks)

Q 6.	Discuss the following function related to the file i) fseek () ii) ftell() iii) rewind() iv) fscanf() v) fprintf()	**5*2=10**	**CO2**
Q 7.	Evaluate the following expression using stack. Demonstrate all internal steps i) 6 2 3 * / 3 4 * + 3 2 * – ii) 10 5 + 60 6 / * 8 –	**5+5=10**	**CO1**
Q 8.	Write a code / function for the following operation related to the queue using array. 1) Insert an element 2) Delete an element 3) Display the content **OR** Write a code / function for the following operation related to the stack using array.	**4+3+3=10**	**CO1**

	1) Push () operation 2) Pop () operation 3) Display operation		
Q 9.	Consider the following sequence of numbers: 10, 20, 30, 15, 25, 5, 12, 7 a) Construct a AVL tree with the above numbers. b) Construct a Binary Search Tree with the above numbers.	**5+5=10**	**CO4**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10.	Write a program to implement the following function for **link list**? a) Insert the node at the end. b) Insert the node at the beginning. c) Delete the node from the end. d) Traverse the link list. **OR** a) Apply the Depth First Search (DFS) and Breadth First Search (BFS) on the following graph and find the sequence. Consider the starting vertex is V1 b) Provide the adjacency list and adjacency matrix representation of the above graph. 	**4*5=20** **OR** **12+8=20**	**CO1 / CO5**
Q 11.	 a) For the given Tree find the Inorder, Preorder and Post order traversal. b) Convert the above Tree to max heap. c) Convert the above Tree to min heap	**10 + 5+5=20**	**CO3**