



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
CSPC32- Data Structures

10/6/2002

Programme: B.TECH

Date: 01.11.2022

Cycle Test-2

Duration: 1 Hour

Session: JULY/2022

Total Marks: 20

Answer all the questions

1. Derive the time complexities for searching operation in BST and AVL tree? What is the height balancing factor, why height balancing is required in AVL trees? Explain with suitable examples [2 M]
2. Write a function to find the second largest element in BST and write the time complexity of the algorithm [3 M]
3. Write a function for inserting an element into the BST and write the time complexity of the function [3]
4. Discuss the different rotations and construct an AVL tree with the following elements [4 M]

48 7 26 44 6 13 9 23 25 91 57 100 5 32

5. Sort the following list of elements by using bubble sort. What are the number of comparisons and swaps you have done during the sorting process of following list of elements and write the time complexity of bubble sort. [4 M]

25, 2, 6, 14, 81, 20, 57, 100, 32, 28

6. Find all possible BFS and DFS orders for the following adjacency matrix [4 M]

	A	B	C	D	E	F
A	0	1	1	1	0	0
B	1	0	0	0	1	1
C	1	0	0	1	0	1
D	1	0	1	0	0	0
E	0	1	0	0	0	0
F	0	1	1	0	0	0