

Code: CS3T2

II B.Tech - I Semester – Regular/Supplementary Examinations
November - 2019

DATA STRUCTURES
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours

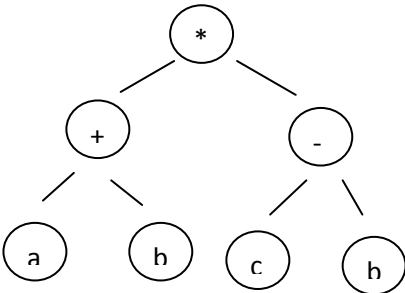
Max. Marks: 70

PART – A

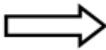
Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

- a) What is ‘Best Case’ and ‘Worst Case’ time complexity analysis?
- b) Write an algorithm for ‘Linear Search’.
- c) What are the applications of Stacks?
- d) Write prefix and postfix traversal of the given tree.



- e) Differentiate Single and Double Linked Lists.
- f) Draw a linked list representation for the below given sparse matrix.

$$\begin{bmatrix} 0 & 0 & 3 & 0 & 4 \\ 0 & 0 & 5 & 7 & 0 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 2 & 6 & 0 & 0 \end{bmatrix}$$


Row	0	0	1	1	3	3
Column	2	4	2	3	1	2
Value	3	4	5	7	2	6

- g) What is the maximum and minimum height of the 'Binary Search Tree' having 33 nodes?
- h) Write the steps involved in linked list representation of the given graph.
- i) Define Spanning Tree
- j) Demonstrate postfix expression evaluation for 456^*+ using Stack.
- k) What is the difference between 'Prim's and Kruskal's' algorithms.

PART – B

Answer any **THREE** questions. All questions carry equal marks.

3 x 16 = 48 M

- 2. a) Write an algorithm for Quick Sort. Write 'Best Case' and 'Worst Case' Time Complexity of a Quick Sort.
10 M
- b) Trace the algorithm for the input: 50, 23, 9, 18, 61, 32.
6 M
- 3. a) Write an algorithm to convert infix to postfix expression.
8 M
- b) Write an algorithm for the following: Stack Creation, Pop and Push Operations.
8 M

4. Write an algorithm for the following operations on a circularly linked list: 16 M
- i) Insertion at beginning.
 - ii) Insertion at a particular position.
 - iii) Deletion at end.
 - iv) Deletion based on value of element.
5. a) What is a Binary Search Tree. Write an Algorithm to insert an element into BST by using Arrays. 8 M
- b) Draw Binary Tree and BST for the following operations 8 M
- i) Insert 32,16,56,25,12,6,9,34,42 in sequence.
 - ii) Delete 25,32,6 after Insertion.
6. a) Write an algorithm with an example for the 'Depth First Search'. 10 M
- b) What are the various mechanisms to represent a graph. 6 M