

Code: IT3T2

**II B.Tech - I Semester–Regular/Supplementary Examinations
November 2018**

**CLASSIC DATA STRUCTURES
(INFORMATION TECHNOLOGY)**

Duration: 3 hours

Max. Marks: 70

PART – A

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

11x 2 = 22 M

1.
 - a) Define data structure.
 - b) Convert the expression $a+b/c-d*e/f$ into prefix and postfix expressions.
 - c) Define Chaining.
 - d) Advantages of linked list over arrays.
 - e) Characteristic features of dynamic arrays.
 - f) Time complexity of Merge Sort.
 - g) Define graph and how graph and tree differ?
 - h) Give the condition to check whether the given stack is full or not when implemented using an array.
 - i) Define height of a BST.
 - j) If N elements are inserted into a BST, what is the worst case height of the Tree?
 - k) List various mechanisms for representing Graphs.

PART – B

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

3 x 16 = 48 M

2. a) Define algorithm and write a brief note on different notations for analysis of algorithms. 8 M
- b) Give precondition for search process, give a trace of searching an element “5” in the unordered list 15, 4, 5, 17, 23, 18, 56, 45, 87, 19, 27 using any searching Algorithm. 8 M
- 3.a) Write a procedure for inserting elements at position ‘p’ in a single linked list. 8 M
- b) Explain the concept of sparse matrix and write a program to perform addition of two matrices represented using sparse matrix. 8 M
4. a) Write a program to implement stack using linked list and different operations over stack. 10 M
- b) Define Queue and Give applications of Queue with suitable examples. 6 M

5. a) Define tree and explain the differences between binary and binary search trees with suitable examples. 6 M

b) Give a trace of implementation of the following binary search tree:

i) Creation of a binary search tree with the elements 15, 4, 5, 17, 23, 18, 56, 45, 87, 19, 27.

ii) Deletion of node 5, Insertion of node 19, and deletion of node 18. 10 M

6. Explain different representation of graph with suitable examples. Write a program to implement graph using adjacency list representation and different operations on graph. 16 M