

Code: IT3T2

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

**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) Explain time and space complexities.
  - b) Differentiate Searching and Sorting.
  - c) Write the structure of a node in Double Linked List.
  - d) How elements can be represented in sparse matrix?
  - e) What is a stack? What are its operations?
  - f) Define a circular queue.
  - g) Define Level and height of a tree.
  - h) What are the tree traversal techniques?
  - i) Explain graph ADT.
  - j) Explain BFS with any example.
  - k) Give the time complexities of linear search and binary search.

## PART – B

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

3 x 16 = 48 M

2. a) Write an algorithm to sort a set of N numbers using quick sort. Trace the algorithm for the following set of numbers : 86,12,24,45,67,95,32469,55,10 8 M
- b) Explain binary search with suitable example. Write the recursive algorithm to perform binary search. 8 M
3. a) Demonstrate Double linked list with various operations along with algorithm. 8 M
- b) Discuss in detail about sparse matrix representation using linked lists. 8 M
4. a) What is a circular queue? What are the Queue operations? 8 M
- b) Write a program to implement circular Queues using dynamic arrays. 8 M

5. a) What is a binary tree ADT? What are the properties of a binary tree? Differentiate Complete and Full Binary trees.

8 M

b) Distinguish between binary tree and BST. Insert the following elements into a BST.

13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18

8 M

6. a) Explain in detail about Graph representation. What are the elementary graph operations?

8 M

b) Write algorithms for BST and DST. Apply them on the given graph.

8 M

