Code: **CSCS1T1**

I M.Tech - I Semester – Regular/Supplementary Examinations – January - 2017

DATA STRUCTURES AND ALGORITHMS
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours   Max. Marks: 70
Answer any FIVE questions.   All questions carry equal marks

1. a) Define algorithm. Explain the properties of an algorithm.

6 M

   b) Explain the operations of circular linked lists.   8 M

2. a) Explain searching. Explain Fibonacci search with algorithm and example.   7 M

   b) Define sorting. Explain heap sort with algorithm and example.   7 M

3. a) Define Binary trees. Discuss various ways of representing binary trees.   6 M

   b) Write an algorithm for BFS traversal. Find BFS traversal for the given graph.
   (where **a** is the source vertex or start vertex)   8 M
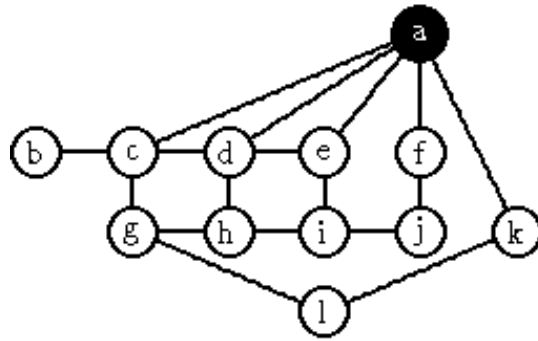
4. a) Define ADT. Explain Stack ADT. 6 M

 b) Define Hashing. Discuss various hash functions. 8 M

5. a) Define heap. Write the functions for insertion and deletion into heap. 8 M

 b) Define external sorting. Discuss external sorting with example algorithm. 6 M

6. a) Create a Binary Search Tree with elements **50, 20, 35, 45, 15, 5, 75, 56, 80, 90, 53.** 4 M

 b) Discuss various applications of binary search trees. 4 M

 c) Write an algorithm for searching in binary search trees. 6 M

7. a) Define AVL tree. What are the advantages of AVL trees over binary search trees? 4 M

b) Build an AVL tree with the values:1**5, 20, 24, 10, 13, 7, 30, 36, 25**.   5 M

c) Write an algorithm for AVL tree insertion.   5 M

8. a) Define RED-BLACK trees. Discuss the properties of RED-BLACK trees.   6 M

b) Build a B tree of order 4 by inserting the values **5, 3, 21, 9, 1, 13, 2, 7, 10, 12, 4, 8.** And delete the following elements from B-tree **2, 21, 10, 3, 4**.   8 M