Code: CS3T2

II B.Tech - I Semester – Regular / Supplementary Examinations November 2017

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

1.
   a) Define recursion with a simple example.
   b) List out the criteria that must be satisfied by all algorithms.
   c) What are the applications of stack?
   d) Write an algorithm to delete from a circular queue.
   e) Write short notes on circularly linked list.
   f) Write the advantages of doubly linked list when compared to singly linked lists.
   g) Define Binary Tree and provide an example.
   h) Draw a binary tree with five nodes and three leaves.
   i) Write a short note on Prim's algorithm.
   j) What is a spanning tree?
   k) Define 'direct recursion' and 'indirect recursion'.

PART – B

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

3 x 16 = 48 M

2. a) Illustrate the use of binary search algorithm to search 32 in the following list of elements. Explain the process at each step.   8 M
   12, 16, 17, 19, 20, 22, 24, 29, 30, 32, 37

   b) Write the algorithm for Quick Sort and also analyze the time complexity.   8 M

3. a) Write an algorithm for infix to postfix conversion.   8 M

   b) Discuss about the stack operations with algorithms.   8 M

4. a) Write an algorithm that determines the length of a circular list.   6 M

   b) Discuss about the singly linked list operations with algorithms.   10 M

5. a) Explain the array and linked representations of binary tree with examples.   8 M

b) Define the binary search tree. Also design an iterative algorithm to search for an element in the binary search tree.   8 M

6. a) Describe the adjacency matrix and adjacency list representation of graphs with the help of an example.
     8 M

b) Write the Kruskal's algorithm to compute the minimum cost spanning tree for an arbitrary input graph.   8 M