Code No: R21051　　　　(**R10**)　　　　(SET - 1)

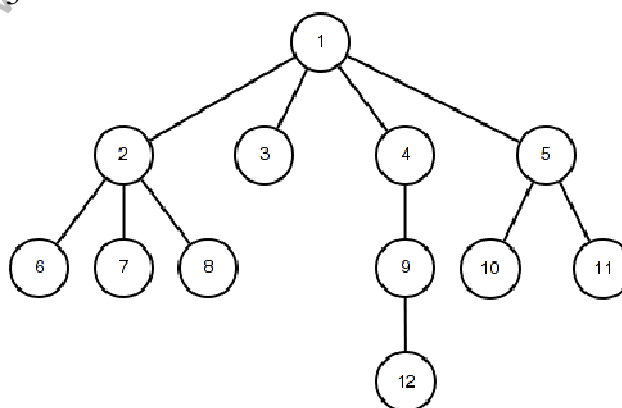**II B. Tech I Semester Supplementary Examinations, Oct/Nov- 2017**
DATA STRUCTURES
(Com. to CSE, IT, ECC)

Time: 3 hours　　　　　　　　　　　　　　　　　　　　Max. Marks: 75

Answer any **FIVE** Questions
All Questions carry **Equal** Marks
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1. a) Differentiate between recursive and iterative algorithms. (6M)

   b) Write a recursive algorithm that counts all occurrences of a given character in a string. (9M)

2. a) Write the algorithm for Radix Sort. (8M)

   b) Using merge sort algorithm, merge the below two sorted lists. (7M)
   6 12 29 37 87 92
   13 21 27 28 29 43 58 67 72 77

3. a) Device an algorithm to copy the contents of one stack to another preserving the order of elements. (A temporary stack may be used, if required) (9M)

   b) Explain how queue operations can be implemented using stack. (6M)

4. a) With an example explain how linked list can be used to represent polynomial expressions. (6M)

   b) Write a C program that accepts a list of integers from keyboard and creates a double linked list using them. (9M)

5. a) Write recursive algorithms for all tree traversal techniques. (10M)

   b) For the tree given below, find out: (5M)
   i) Ancestors of 9
   ii) Siblings of 3
   iii) Height of sub tree 4
   iv) Degree of 2
   v) Children of 5

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6. a) What is a balanced binary search tree? Why trees are t be balanced? With   (7M)
        examples list different types of balanced binary search trees.
    b) Write an algorithm to find smallest and largest elements in a binary search tree.   (8M)

7. a) If vertices of a graph are labeled from A to F, draw the pictorial form of graph   (7M)
        from the adjacency matrix given below:

$$\begin{pmatrix} 1 & 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 \end{pmatrix}$$

        And also represent the same graph using adjacency list.
    b) State and explain Prim's algorithm with an example.   (8M)

8.   What is ADT? Describe the implementation of stack ADT.   (15M)