PARUL UNIVERSITY
FACULTY OF IT & COMPUTER SCIENCE
Parul Institute of Computer Application
Bachelor of Computer Application
2017–18 Mid Semester Examination

Semester: 2   **Date: 27/03/2018**
Subject Code: 05101152   **Time: 10:00 to 12:00**
Subject Name: Data Structure   **Total Marks: 40**

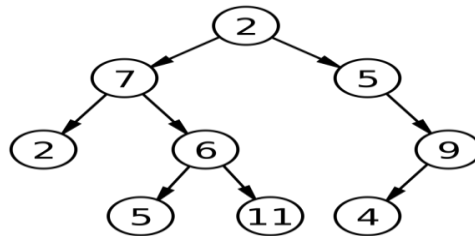**Instructions:**
1. Figures to the right indicate full marks.
2. Make suitable assumptions wherever necessary.

Q.1   Answer the following.   **[10]**

(a)   Answer the following short questions.   **[3]**

    1)   Representation of polynomial using array for given equation.
       $x^3+2y^3+2x^2-4x^2y^2+3y-x-1$

    2)   List types of Data Structure and explain any one in brief.

    3)   Delete Node **2** from below Tree

(b)   Solve MCQ.   **[7]**

    1) Binary search algorithm can be applied to …
       A) sorted list   B) binary trees
       C) non linear array   D) pointer array
    2) ………… is very useful in situation when data have to stored and then retrieved in reverse order.
       A) Stack   B) Tree
       C) Array   D) None of above
    3) Stack works on the principle:
       A) First In First Out   B) Last in first out
       C) None   D) Both a & b
    4) A terminal node in a binary tree is called …………
       A) Root   B) Leaf
       C) Child   D) Branch

    5)   In ……………, search start at the beginning of the list and check every element in the list.

       A) Linear search   B) Binary search

       C) Hash Search   D) Binary Tree search

6) In C Programming, what will be the value of top, if there is a size of stack STACK_SIZE is 6

    A) 5   B) 6
    C) 4   D) None

7) To represent hierarchical relationship between elements, which data structure is suitable?

    A) Stack   B) Array
    C) Tree   D) all of above

Q.2 Answer the following.   **[10]**

(a)   **[4]**

1) Write a Short note on sparse matrix with suitable example.

2) Construct the binary Tree for given set

14,15,4,9,7,18,3,5,16,20,17,10

(b)   **[6]**

1) Define Data Structure and Write any Five Application of Data Structure.

2) Traverse the given binary tree using all three traversal techniques.

Q.3 Attempt any TWO.   **[10]**

1   What is stack? Explain PUSH and POP operation with Algorithm.   **[5]**

2   What is Binary Tree? Give any example of Binary Tree. Explain the types of Binary Tree with Example.   **[5]**

3   Write a Factorial Algorithm with suitable example.   **[5]**

Q.4 Answer the following.   **[10]**

(a)   Convert the given expression into postfix expression using algorithm steps: **[5]**
A+B(C-D/E)

(b)   Explain quick sort algorithm in detail. Also Write Algorithm and complexity. Solve the following example.   **[5]**

      23, 20, 11, 89, 69, 3, 56, 5, 45, 40

OR

(b)   Write algorithms for binary search algorithms. And solved the following Example. Find number **5** from the blow list.   **[5]**

      23, 20, 11, 89, 69, 3, 56, 5, 45, 40