PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech.Winter2019 - 20Examination

Semester: 3   Date: 29/11/2019
Subject Code: 203105205/03105203   Time: 2:00pm to 4:30pm
Subject Name: Data Structures and Algorithms   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions. (All are compulsory) (Each of one mark)   **(15)**

1. The Data structure used in standard implementation of Breadth First Search is?
   a) Stack   b) Queue   c) Linked List   d) Tree
2. Which type of traversal of binary search tree outputs the value in sorted order?
   a) Pre-order b) In-order   c) Post-order   d) None
3. Which of the below diagram is following AVL tree property?

I.   II.
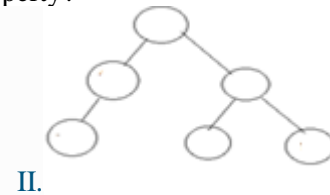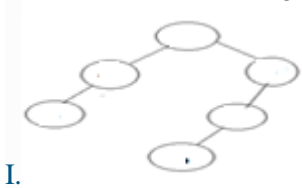
   a) only I   b) only I and II   c) only II   d) None
4. In linked list each node contain minimum of two fields. One field is data field to store the data second field is?
   a) Pointer to character   b) Pointer to integer   c) Pointer to node   d) Node
5. What is the postfix expression for the a + b * c + (d * e) infix expression?
   a) abc*+de*+   b) abc+*de*+   c) a+bc*de+*   d) abc*+(de)*+
6. The number of edges from the root to the node is called _____ of the tree.
7. Time complexity of bubble sort in best case is _____ .
8. For the Quick sort, time complexity of best case is _____ and worst case is _____ .
9. The pre-order and in-order traversals of a binary tree are T M L N P O Q and L M N T O P Q.
   _____ is post-order traversal of the tree?
10. _____ is the most appropriate data structure for reversing a word?
11. Write the syntax to allocate memory for node in linked list.
12. What is a hash table?
13. In Preorder traversal of binary tree right subtree is traversed before visiting root. (True/ False)
14. Hashing can be used in online spelling checkers. (True/ False)
15. What is In-order Successor node in Binary Search Tree?

Q.2 Answer the following questions. (Attempt any three)   **(15)**
   A) Define: i) Cyclic Graph ii) Siblings iii) Strictly Binary Tree. Also give example.
   B) Explain rotation operations in AVL trees with suitableexamples.
   C) Explain different types of queue with example.
   D) Write the algorithm of Insertion Sort.

Q.3 A) Write algorithm for inserting an element at end in circular queue and deletinga first nodefrom a   **(07)**
   singly linked list.
   B) Explain collision in the context of hashing? Discuss collisionresolution techniques.   **(08)**
                                        OR
   B) Sort the following value using Heap-sort (Max heap)   **(08)**
        4   3   7   1   8   5

Q.4 A) Write apseudo code for inserting an element in a stack, removing an element from stack. **(07)**

OR

A) Explain BFS and DFS in detail. **(07)**

B) For the given Binary search tree perform the following operation. **(08)**
Delete (4), Delete (10) and Delete (27). Insert (5), Insert (22), Delete (17) Explain the Operation.