

2012

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

*Answer any **five** questions in which Q. No. 1 is compulsory.*

1. Indicate correct answer from the following :

   (a) On which principle does stack work ?

   (i) FILO

   (ii) FIFO

   (iii) LILO

   (iv) Both (i) and (iii)

   (b) Can linked list be implemented using arrays ?

   (i) Yes

   (ii) No

(c) AVL trees have a faster _____.

(i) Insertion (ii) Deletion

(iii) Updation (iv) Retrieval

(d) Which of the following statements hold true for binary trees ?

(i) The left subtree of a node contains only nodes with keys less than the node's key

(ii) The right subtree of a node contains only nodes with keys greater than the node's key

(iii) Both (i) and (ii)

(iv) Not left and right subtree nodes contains only nodes with keys less than the node's key

(e) The time required in best case for search operation in binary tree is :

(i) O(n) (ii) O(log n)

(iii) O(2n) (iv) O(log 2n)

(f) Which of the following ways below is a pre order traversal ?

(i) Root → Left subtree → Right subtree

(ii) Root → Rignt subtree → Left subtree

(iii) Right subtree → Left subtree → Root

(iv) Left subtree → Right subtree → Root

(g) Which of the following linked list below have last node of the list pointing to the first node ?

(i) Circular doubly linked list

(ii) Circular linked list

(iii) Circular singly linked list

(iv) Doubly linked list

(h) Items in a priority queue are entered in a _____ order.

(i) Random

(ii) Order of priority

(iii) As and when they come

(iv) None of the above

2. (a) What are primitive and non-primitive data structures ? Give examples.

(b) Write a C program to find the length of a string.

3. (a) What are the characteristics of an array ?

(b) Write an algorithm to insert an element into an array.

4. (a) What is a deque ? How is it different from a liner queue ?

(b) Write an algorithm to insert elements in deque.

5. (a) Explain time-space complexity of an algorithm.

(b) What are the different categories of algorithm ?

6. (a) What is Bubble Sort ? Explain with example.

(b) Explain Binary Search and Linear Search.

7. What is a Stack ? Explain the algorithm to create and delete items in stacks.

8. (a) What is linked list ? Explain insertion and deletion of items in linked list using pointers.

(b) Explain circular linked list with example.

9. What is a tree ? Explain the various traversing methods in trees.