2013

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

1. Indicate the correct answer from the following :

(a) The complexity of linear search algorithm is :

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

(iii) $O(n^2)$ (iv) O(n – 1)

(b) Which of the following cases does not exist in complexity theory ?

(i) Best cases (ii) Worst cases

(iii) Average cases (iv) Null cases

(c) Queue is a _____ list.

(i) LIFO (ii) LILO

(iii) FILO (iv) FIFO

(d) The operation of processing each element in the list is known as :

(i) Sorting

(ii) Merging

(iii) Insert

(iv) Traversing

(v) None of these

(e) A technique for direct search is :

(i) Binary search

(ii) Linear search

(iii) Hashing

(iv) Tree search

(f) Which of the following data structure is used to implement recursion ?

(i) Array (ii) Queue

(iii) Stack (iv) Linked list

(g) The best sorting method, in which number of swapping done, is :

(i) Quick sort (ii) Insertion sort

(iii) Selection sort (iv) Bubble sort

(h) Which of the following data structure is non-linear ?

(i) Strings

(ii) Lists

(iii) Stacks

(iv) None of these

2. (a) What is Queue ? How is it different from stack ? Explain with example.

(b) Write an algorithm to insert items in Queue using array.

3. (a) Explain doubly linked list with example.

(b) How we insert and delete node from a list ? Explain with diagram.

4. Transform each of the following expression to prefix and postfix :

(a) (A + B) * (C – D) $ E * F

(b) A – B / (C * D $ E)

5. Discuss about data structure and its type with example.

6. What do you mean by sorting ? Write the different types of sorting methods. Explain the procedure of bubble sort with example.

7. (a) How searching is different from sorting ? Discuss with example.

   (b) Discuss about Dynamic Memory Management with example.

8. (a) What is Hashing ? Write the procedure of binary tree hashing.

   (b) Write the different steps involved in Breadth First Search and Depth First Search.

9. (a) Write the differences between binary tree and balanced tree with diagram.

   (b) In which condition, we prefer binary search over linear search ? Write algorithm for binary search.