2019

Time : 3 hours

Full Marks : 70

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

The figures in the margin indicate full marks.

*Answer from **all** the Sections as directed.*

Section – A
(Compulsory)

1. Choose the correct answer from the given alternative : 2×10 = 20

   (a) What are the advantage of arrays ?

   (i) Object of mixed data types can be stored

   (ii) Element in an array cannot be sorted

   (iii) Index of first element of an array is 1

   (iv) Easier to store elements of same data type

(b) In a stack, of a user tries to remove an element it is called :

(i) Create

(ii) Push

(iii) Evaluation

(iv) Pop

(c) What is the value of the postfix expression 6324 + – * ?

(i) 1

(ii) 40

(iii) 74

(iv) – 18

(d) The prefix form of an infix expression (p + q) – (r * t) is :

(i) + pq – * rt

(ii) – + pqr * t

(iii) – + pq * rt

(iv) – + * pqrt

(e) A linear list of element in which deletion can be done from one end (front) and insertion

can take place only at other end (rear) is know as :

(i) Queue

(ii) Stack

(iii) Tree

(iv) Linked list

(f) If the element "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed ?

(i) ABCD

(ii) DCBA

(iii) DCAB

(iv) ABOC

(g) A linear collection of data element where the linear node is given by means of pointer is called ?

(i) Linked list

(ii) Node list

(iii) Primitive list

(iv) Unordered list

(h) In a linked list implementation, a node carries information regarding :

(i) Data

(ii) Link

(iii) Data and Link

(iv) Node

(i) What is the worst case complexity of bubble sort ?

(i) O (n log n)

(ii) O (log n)

(iii) O (n)

(iv) O (n^2)

(j) Reverse polish notation is the other name of :

(i) Infix expression

(ii) Prefix expression

(iii) Postfix expression

(iv) Algebric expression

Section – B

(Short-answer Type Questions)

Answer any **four** questions of the following : 5×4 = 20

2. What is a Linked List ? Explain its type.

3. What do you understand by overflow and underflow is a queue ?

4. Explain the term tree ? Write the properties of a Binary Search Tree.

5. Explain Inorder, Preorder and Postorder traversal operation on Binary Tree with example.

6. Define Data Structure. What are different classification of data structure ? Explain with examples.

7. Differentiate between Stack and Queue.

8. WAP to search an element in an array using binary search.

9. Describe the difference between a circular and singly linked list.

Section – C

(Long-answer Type Questions)

Answer any **two** questions of the following : $15 \times 2 = 30$

10. What is a Queue ? Explain its operations using an Array.

11. What is a bubble sort ? Explain how the following list can be sorted using bubble sart algorithm.

13 7 9 32 76 98 100 32 88 6 19

12. Explain the following :

(a) Application of tree

(b) Working of Insection Sort

13. Convert the following expression to there postfix equivalent :

(a) (A + B) – (* D / (E – F / G)

(b) ((a * b – (c + d / e^f) – g) h)

(c) (A / B) + (C * D) – (D / E)