BCA(III)—Data Struc. (301)

Core – V

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 alternatives : 2×10 = 20

   (a) Which data structure is defined as a collection of similar data elements ?

   (i) Arrays

   (ii) Linked lists

   (iii) Trees

   (iv) Graphs

(b) If TOP = MAX – 1, then that the stack is :

(i) Empty

(ii) Full

(iii) Contains some data

(iv) None of these

(c) Consider the linked list of n elements. What is the time taken to insert an element after an element pointed by some pointer ?

(i) O

(ii) $O(\log_2 n)$

(iii) O(n)

(iv) $O(n \log_2 n)$

(d) A binary tree has a height of 5. What is the minimum number of nodes it can have ?

(i) 31

(ii) 15

(iii) 5

(iv) 1

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

(i) Infix expression

(ii) Prefix expression

(iii) Postfix expression

(iv) Algebraic expression

(f) In a queue, insertion is done at :

(i) Rear

(ii) Front

(iii) Back

(iv) Top

(g) Pre-order traversal is also called :

(i) Depth first

(ii) Breadth first

(iii) Level order

(iv) In order

(h) In which sorting, consecutive adjacent pairs of elements in the array are compared with each other ?

(i) Bubble Sort

(ii) Selection Sort

(iii) Merge Sort

(iv) Radix Sort

(i) The complexity of binary search algorithm is :

(i) O(n)

(ii) $O(n)^2$

(iii) O(n log n)

(iv) O(log n)

(j) The process of examining memory locations in a hash table is called :

(i) Hashing

(ii) Collision

(iii) Probing

(iv) Addressing

Section – B

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

2. How many ways can you categorize data structure ? Explain each of them.

3. Briefly explain the concept of any of pointers.

4. Is it possible to create an array of structure ? Explain with the help of an example.

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

6. What do you understand by stack overflow and underflow ?

7. Explain the concept of a circular queue. How is it better then a linear queue ?

8. Discuss the advantages of an AVL tree.

9. Explain the graph traversal algorithm in detail with example.

Section – C

Answer any **two** questions of the following :

15×2 = 30

10. Write a function for adding (inserting) an element at last. Also a function for delete an element from beginning in singly linked list.

11. What is stack ? Explain all the operation of stack with array implementation.

12. Explain the term infix expression, prefix expression and postfix expression. Convert the following expression to their postfix equivalents :

(a) ((A – B) + D/(E + F) * G))

(b) (A * B) + (C / D) – (D + E)

13. Explain the concept of a tree. Discuss its applications. Also explain its representation technique.