SE – 338

II Semester B.C.A. Examination, September 2020
(CBCS) (F+R)
(2014-15 and Onwards)
COMPUTER SCIENCE
BCA 203 : Data Structures

Time : 3 Hours Max. Marks : 70

Instruction : *Answer **all** Sections.*

SECTION – A

Answer **any ten** questions. **Each** question carries **two** marks. **(10×2=20)**

1. What are non-linear data structures ? List any two non-linear data structures.
2. State with example any two word processing operations.
3. State any four mathematical functions.
4. Compare array v/s linked list method of storage.
5. What is a sparse matrix ? Illustrate with an example.
6. State the different types of linked lists.
7. State any two applications of stack.
8. Convert the following expression in postfix format :
   8 * (3 + 5) / 4 – 2.
9. What are the typical operations performed on non-primitive data structures ?
10. Compare linear queue v/s circular queue.
11. What is directed graph ? Give an example.
12. What is a binary search tree ?

SECTION – B

Answer **any five** questions. **Each** question carries **ten** marks. **(5×10=50)**

13. a) Explain the different asymptotic notations. **5**
    b) What is an ADT ? Explain its relevance in the study of data structures. **5**

P.T.O.

14. a) Explain with an example the working of any one string matching algorithm. 5

    b) Write the 'C' functions for the following string operations : 5

        i) Length of a string.

        ii) String concatenation.

15. a) Write a 'C' program for sorting an array using Bubble sort technique. 5

    b) Write a note on dynamic memory allocation and garbage collection. 5

16. a) What is a linked list ? Describe the node of a single linked list and the linked list operations. 5

    b) Write algorithms for the following single linked list operations : 5

        i) Insert a node at the beginning of a linked list.

        ii) Searching a value in a linked list.

17. a) Write an algorithm for converting an infix expression into postfix expression. 4

    b) Discuss the different types of queues. 6

18. a) What is a binary tree ? Explain the following : 5

        i) Full/complete binary tree.

        ii) Strictly binary tree.

        iii) Almost complete binary tree.

    b) Draw a BST for the following and perform pre order, in order and post order traversals. 5

        7, 4, 9, 11, 12, 8, 3, 1, 2

19. a) What is recursion ? Write a recursive function for the tower of Hanoi problem. 5

    b) Write a C program for linear search. 5

20. a) Discuss with examples the methods of graph representation. 5

    b) Explain the DFS method of graph traversal. 5