SM – 617

II

II Semester B.C.A. Examination, May/June 2018
(CBCS)
(F+R) (2014 – 15 & Onwards)
Computer Science
BCA203 : DATA STRUCTURES

Time : 3 Hours Max. Marks : 70

Instruction : *Answer **all** questions.*

SECTION – A

Answer **any 10** questions. **(10×2=20)**

1. Define data structure.
2. What are linear data structures ? Name any two linear data structure.
3. Define the terms :
   i) Space complexity.
   ii) Time complexity.
4. Mention the disadvantages of an array.
5. Define sparse matrix.
6. What is a linked list ?
7. Mention various types of linked list.
8. Differentiate between stacks and queues.
9. Mention the applications of stack.
10. What is a circular queue ?
11. Define the terms :
    i) Graph
    ii) Tree.
12. Give examples for :
    i) Complete binary tree.
    ii) Degree of vertex.

P.T.O.

SECTION – B

Answer **any 5** questions : **(10×5=50)**

13. a) Explain various operations performed on data structures. **5**

    b) Illustrate asymptotic notations with examples. **5**

14. a) Write an algorithm for inserting an element into a linear array. **5**

    b) Write a C program to sort N elements using bubble sort. **5**

15. a) Explain the node structure of a singly linked list. Mention the advantages of linked list over arrays. **5**

    b) Write an algorithm to insert a node at the end of the linked lsit. **5**

16. Write a menu driven C program to implement stack operations. **10**

17. a) Explain selection sort algorithm with an example. **5**

    b) Evaluate the following postfix expression 65 * 78 + * 87 – 45 * ++. **5**

18. a) Explain BST. **5**

    b) Write recursive functions for tree traversals. **5**

19. a) Explain adjacency matrix and adjacency list with suitable examples. **5**

    b) Write Depth First search algorithm to traverse a graph. **5**

20. a) Explain any four mathematical functions. **4**

    b) Write C functions to implement following string handling functions. **6**
    i) String length
    ii) String concatenation.
    without using built in functions.
