



SM - 617

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.



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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 list. 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. 5
b) Write C functions to implement following string handling functions. 6
 - i) String length
 - ii) String concatenation.without using built in functions.

