

II Semester B.C.A. Examination, May/June 2018  
(CBCS)

(F+R) (2014 - 15 & Onwards)

Computer Science

BCA203 : DATA STRUCTURES

Max. Marks : 70

Time : 3 Hours

**Instruction :** Answer all questions.

SECTION - A

(10×2=20)

Answer any 10 questions.

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 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. 4  
b) Write C functions to implement following string handling functions. 6  
i) String length  
ii) String concatenation.  
without using built in functions.