



**II Semester B.C.A. Degree Examination, May 2017**  
**(F + R) (CBCS)**  
**(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 is linear data structure ? Give an example.
2. Define space and time complexities of an algorithm.
3. What is recursion ?
4. What is dynamic memory allocation ?
5. Define stack.
6. Compare linear search and binary search methods.
7. What is circular queue ?
8. Write the differences between stack and queue.
9. Give the node structure of a doubly linked list.
10. Define the terms :
  - i) Binary tree.
  - ii) Complete binary tree.
11. Mention the different ways of tree traversal.
12. Mention the graph traversal methods.

P.T.O.





## SECTION – B

Answer **any five** questions. **Each** question carries **ten** marks.

(5×10=50)

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|---|---|
| 13. a) Explain various types of data structures.  | 6 |
| b) Briefly explain any four string handling functions.  | 4 |
| 14. a) Explain selection sort algorithm.  | 5 |
| b) Write an algorithm to delete an element from the array.  | 5 |
| 15. a) Define linked list. Mention the applications of the linked list.   | 5 |
| b) Write an algorithm for searching a node in the singly linked list.   | 5 |
| 16. a) Mention various applications of the stack.   | 5 |
| b) Evaluate the following postfix expression<br>$95 + 36 * + 97 - 1$ .  | 5 |
| 17. a) Write C functions to perform insertion and deletion operations of a queue.                                 | 5 |
| b) What is queue ? Mention its underflow and overflow conditions.   | 5 |
| 18. a) Briefly explain infix, prefix and postfix expressions.   | 5 |
| b) Convert the following infix expression into its equivalent postfix expression<br>$(a + b) * (m/n) + (x + y)$ . | 5 |
| 19. a) Define the terms (a) Graph (b) Degree of a vertex.   | 4 |
| b) Write depth-first-search algorithm.  | 6 |
| 20. a) Define Binary search tree. Give an example.  | 4 |
| b) Briefly explain various tree traversal methods with suitable examples.   | 6 |
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**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.
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Q.P. Code : 15221

Second Semester B.C.A. Degree Examination, May/June 2019

(CBCS – Freshers)

Computer Science

Paper BCA 203 — DATA STRUCTURES

Time : 3 Hours]

[Max. Marks : 70

Instructions to Candidates : Answers All Sections.

SECTION – A

Answer any **TEN** questions, each question carries **2** marks : (10 × 2 = 20)

1. What is non-linear data structure?
2. Define space and time complexity of an algorithm.
3. What is recursion?
4. What is dynamic memory allocation?
5. What is circular queue?
6. Compare linear search and binary search techniques.
7. Write 'C' function to find number of characters in a string.
8. Differentiate between terminal and non-terminal nodes of a tree.
9. List disadvantages of a Linked List.
10. Mention different ways of graph traversals.
11. List different operations on Binary Tree.
12. What is Binary Search Tree?

SECTION – B

Answer any **FIVE** questions, each question carries **10** marks : (5 × 10 = 50)

13. (a) Explain classification of data structure and operations on data structure. (6)
- (b) Explain Asymptotic notations. (4)

**Q.P. Code : 15221**

14. (a) Write an algorithm to insert an element into an array at a specified position. (5)  
(b) Write a C program to extract a substring from a given string. (5)
15. (a) Write a C function to perform insertion and deletion operations on stack. (5)  
(b) Write a C function to implement bubble sort. (5)
16. (a) Define a Linked List? Explain different types of linked list, mention the advantages of linked list. (6)  
(b) Write an algorithm to insert a node at the beginning of a linked list. (4)
17. (a) Write an algorithm to delete an element into priority queue. (5)  
(b) Write an algorithm to evaluate postfix expression. (5)
18. (a) What is double ended queue? Write an algorithm to insert an element at rear end of the deque. (6)  
(b) What is Queue? Mention applications of queue. (4)
19. (a) Explain strictly and complete binary tree with example. (4)  
(b) Write an algorithm for the following :  
(i) In order tree traversal  
(ii) Post order tree traversal  
(iii) Preorder tree traversal. (6)
20. (a) Write an algorithm for Breadth first search. (5)  
(b) Define properties of Binary Tree. (5)
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