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**BSCCSCN 201**

**Second Semester B.Sc. Degree Examination, September 2022  
(NEP – 2020)  
(2021 – 22 Batch Onwards)  
COMPUTER SCIENCE – 2  
Data Structures Using C (DSCC)**

Time : 2 Hours

Max. Marks : 60

**Note :** Answer **any six** questions from Part – A and **one full** question from **each** Unit of Part – B.

PART – A

(6×2=12)

1. a) What is a recursion ?
- b) What is sparse matrix ? Give example.
- c) Give two advantages of linked list over arrays.
- d) What is two-way list ? Write the use of it.
- e) Mention the applications of a queue.
- f) What is meant by priority queue ? What is its use ?
- g) Define complete binary tree. Give an example.
- h) Mention the application of graphs.

PART – B

**Unit – I**

2. a) Write an algorithm to sort a list of numbers using quick sort.
- b) Write the recursive algorithm to find the GCD of a number. (6+6)
3. a) Trace the following list of numbers using bubble sort.  
6, 20, 14, 16, 22, 10, 89
- b) Explain any four operations performed by data structure.
- c) Explain linear and non-linear data structures with examples. (5+4+3)

P.T.O.

**Unit – II**

4. a) Draw the different types of linked lists with diagram.  
b) Write an algorithm for insert a node in between in doubly linked list.  
c) Explain linear search with an example. **(4+4+4)**
5. a) Write an algorithm to insert a node at end of singly linked list.  
b) Explain any two dynamic memory handling functions in C.  
c) How do you represent a polynomial using a linked list ? Explain with an example. **(5+4+3)**

**Unit – III**

6. a) How do you represent linked queue ? Write algorithms for insert and delete operations.  
b) Write an algorithm to convert infix to postfix expression. **(6+6)**
7. a) Write an algorithm to PUSH and POP elements from a stack using arrays.  
b) Convert following infix expression to postfix.  
i)  $(A + B) * (C \wedge D) / E + F$   
ii)  $A + (B * C / D) * E$  **(6+6)**

**Unit – IV**

8. a) Draw the binary tree for the following inorder and preorder traversal.  
Inorder : C B D A I F E G H  
Preorder : A B C D E F I G H  
b) Explain the two possible ways by which the graph can be represented. **(6+6)**
9. a) Explain breadth first search algorithm.  
b) Define the following with respect to tree.  
i) node  
ii) siblings  
iii) degree of a tree  
iv) edge. **(6+6)**
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