

Reg. No.

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BCACACN 202



**Second Semester B.C.A. Degree Examination, June/July 2024
(NEP – 2020) (2021 – 22 Batch Onwards)
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 in Part – B.

PART – A

(6×2=12)

1. a) Define linear and non-linear data structure. Give an example.
- b) What is sparse matrix ? Give an example.
- c) Define searching. Name any 2 types of searching techniques.
- d) Write an advantage of linked list over arrays.
- e) What is stack ? Name the basic operations performed on stack.
- f) What is garbage collection ?
- g) Name the 2 ways of representing trees in memory.
- h) Define the terms with respect to graph.
 - i) adjacent node.
 - ii) directed edge.



PART – B

UNIT – I

(4×12=48)

2. a) What do you mean by traversing a linear array ? Write an algorithm to traverse a linear array. **(4+4+4)**
- b) Write an algorithm to generate 'N' Fibonacci numbers using Recursion.
- c) Explain bubble sort with an example.
3. a) Explain insertion sort with an example. **(4+4+4)**
- b) Write an algorithm for selection sort.
- c) Explain the representation of two dimensional array in memory.

P.T.O.



UNIT – II

4. a) What is linear search ? Write an algorithm for linear search. (4+4+4)
b) What is circular linked list ? Explain.
c) Write an algorithm to insert an item into the beginning of the linked list.
5. a) Explain binary search with an example. (4+4+4)
b) Write an algorithm to delete a given node from the linked list.
c) Write a note on memory allocation and deallocation functions.

UNIT – III

6. a) Write an algorithm for PUSH and POP operations using arrays. (4+4+4)
b) Write an algorithm to convert infix expression into postfix expression.
c) What is priority queue ? Explain.
7. a) Write an algorithm to delete an item from stack using linked list. (4+4+4)
b) Evaluate the following postfix expression showing the stack status.
P : 3, 5, +, 6, 4, -, *, 4, 1, -, 2, ^, +.
c) Write an algorithm to insert an element into a queue using linked list.

UNIT – IV

8. a) Write a note on : (4+4+4)
i) Complete binary tree.
ii) Extended binary tree.
b) Define the terms with respect to tree.
i) Root node.
ii) Terminal nodes.
iii) Degree of a node.
iv) Depth.
c) Write an algorithm for Depth First Search (DFS) for a graph.
9. a) Draw the binary tree for the following inorder and preorder traversal. (6+6)
Inorder : E, A, C, K, F, H, D, B, G
Preorder : F, A, E, K, C, D, H, G, B
And also give its postorder traversal.
b) Explain linked representation of binary tree with an example.

