

**18012**

**B.C.A. Examination, Dec.-2023**

**Data Structure using C and C++**

**(BCA-302)**

*Time : Three Hours / [Maximum Marks : 75*

**Note :** Attempt **all** the Sections as per instructions.

**Section-A**

**(Very Short Answer Type Questions)**

**Note :** Attempt **all five** questions. Each question carry 3 marks.  $3 \times 5 = 15$

1. What do you mean by Sparse arrays?  
Give example. 3
2. Where can we use Stack? Give applications of stack. 3
3. How can you represent a Binary Tree in memory using array? 3

4. What is Hashing. What are its advantages. 3
5. Explain Priority Queue in brief. 3

**Section-B**

**(Short Answer Question)**

**Note :** Attempt any **two** questions.

6. Write an algorithm to convert a given infix expression to postfix expression. Trace the steps involved in converting the given infix expression  $((A+B)^C) - ((D*C)/F)$  to post fix expression. 7.5
7. Give difference between Linear and Binary Search. Also write a C program to implement Binary Search. 7.5
8. Write C program to show insertion and deletion in a simple Queue. 7.5

## Section-C

### (Long Answer Question)

**Note :** Attempt any **three** questions.

$$3 \times 15 = 45$$

9. Perform Heap Sort on given keys, Arrange them in descending order: 15

K=2, 9, 7, 6, 5, 8

10. Construct a Binary Tree from its 15

Inorder Traversal  $\rightarrow$  D, B, E, A, F, C

Preorder Traversal  $\rightarrow$  A, B, D, E, C, F

11. Write a C Program to multiply two 2-Dimensional matrix of  $3 \times 3$  and store the result in another matrix. 15

12. Implement Singly linked list using dynamic memory allocation. 15

13. Write short notes on:

15

- (a) Collision resolution techniques
- (b) B-Trees
- (c) D-Queues

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