

**Paper: 21CAC-7P**  
**Theory/Week: 4 Hours**  
**Credits: 2**

**Lab on Data Structures  
using C++**

**Hours: 40**  
**IA: 25**  
**Exam: 25**

**Course Objective:**

- To train the student in understanding the data structure implementation in C++.
- To develop the skills to write programs for searching and sorting in C++.
- To teach the fundamentals of operations of stacks, queues, lists, and trees using C++ programming.

**Course outcome:**

CO1: To outline basic concepts of data structures using C++.

CO2: To demonstrate a basic operation of stacks, queues, lists, and trees.

CO3: To analyze the various sorting and searching techniques in C++

**PART -A**

1. Write a C++ program to sort the given list using the selection sort technique.
2. Write a C++ program to sort the given list using the insertion sort technique.
3. Write a C++ program to sort the given list using the bubble sort technique.
4. Write a C++ program to search an element using a linear search technique.
5. Write a C++ program to search an element using a binary search technique.
6. Write a C++ program to implement Towers of Hanoi.
7. Write a C++ program to implement a dynamic array. Also, find the smallest and largest element.

**PART-B**

1. Write a C++ program to sort the given list using the merge sort technique.
2. Write a C++ program to sort the given list using the quick sort technique.
3. Write a C++ program to implement Stack operations using arrays.
4. Write a C++ program to implement Queue operations using arrays.
5. Write a C++ program to evaluate postfix expression.
6. Write a C++ program to implement a circular queue using an array.
7. Write a C++ program to implement Stack operations using a linked list.
8. Write a C++ program to implement Queue operations using a linked list.

**Teaching Methodology**

Experimental learning

Problem solving through example.

Blended learning through internet

Experiential learning

**Continuous Internal Assessment (CIA) Method:**

Sl. No	Type of Assessment	Mode of Assessment	Marks
1	Observation Book	The regular mode of Assessment	5
2	Lab Internal	The regular mode of Assessment	10
3	Record	The regular mode of Assessment	5
4	Attendance		5
<b>Total</b>			<b>25</b>

**SCHEME OF EXAMINATION FOR END SEMESTER EXAMINATION OF 50 MARKS:**

Two experiments, one from each part are to be performed by the students in the examination.

Sl. No	Type of Assessment	Mode of Assessment	Marks
1	Part –A	The regular mode of Assessment	10
2	Part –B	The regular mode of Assessment	10
3	Viva	The regular mode of Assessment	5
<b>Total</b>			<b>25</b>