UNIVERSITY OF MUMBAI
Practical Examination – March 2022
M.C.A Semester – I
LABORATORY MCAL11
[MCAL11: Lab Data Structures with C and / C++]

Duration: 2 hours **Marks:30 Marks**

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Roll No.: 2

Q1		**Attempt All**	**20**
	A	Stack Implementation using Linked List - Push,POP,Display.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort.	
	B	Implementation of searching algorithms Linear Search and Binary search.	

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Roll No.: 4

Q1		**Attempt All**	**20**
	A	Queue Implementation using Linked List enqueue,Dequeue,Display	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Insertion Sort	
	B	Stack Array implementation Push,POP,Display,Peek.	

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Roll No.: 6

Q1		**Attempt All**	**20**
	A	Stack application:Evaluation of postfix expression	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort	
	B	Queue Array Implementation Insert,Delete,Display.	

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Roll No.: 8

Q1		**Attempt All**	**20**
	A	Circular Queue implementation using Linked List Insert, Delete,Display.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Shell Sort	
	B	Binary Search Tree Traversal Inorder,Preorder,Postorder	

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Roll No.: 10

Q1		**Attempt All**	**20**
	A	Linked List implementation of priority queue enqueue,dequeue,Print.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort	
	B	Implementation of Linked List Count no. of nodes and Reverse Linked List	

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Roll No.: 12

Q1		**Attempt All**	**20**
	A	Linked List implementation of Double ended queue enqueue,dequeue,Print.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Quick Sort	
	B	Operation on BST ● Largest Node ● Smallest Node ● Count number of nodes	

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Roll No.: 14

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Singly Linked Lists	
Q2		**Attempt any one**	**10**
	A	Write a program to implement radix sort	
	B	Implementation of Graph traversal DFS	

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Roll No.: 16

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Circular Linked List	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Insertion Sort	
	B	Implementation of Graph traversal BFS	

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Roll No.: 18

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Doubly Linked Lists	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort	
	B	Find the minimum spanning tree using Kruskal's Algorithm	

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Roll No.: 20

Q1		**Attempt All**	**20**
	A	Operation on BST ● Largest Node ● Smallest Node ● Count number of nodes ● Traversal (Inorder,Preorder,Postorder)	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort.	
	B	Find the minimum spanning tree using Prim's Algorithm	

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Roll No.: 19

Q1		**Attempt All**	**20**
	A	Write a program using Stack for Balancing of Parenthesis	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Bubble Sort	
	B	Write a program to implement Modulo Division method with Linear Probe as collision resolution technique.	

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Roll No.: 17

Q1		**Attempt All**	**20**
	A	Write a program to implement a Binary Search Tree with insertion, Traversal. find the total number of nodes, and leaf nodes in the binary tree.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement BFS using a Queue.	
	B	Write a Program to implement Shell Sort	

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Roll No.: 15

Q1		**Attempt All**	**20**
	A	Demonstrate application of linked list :Polynomial Addition	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Fold Shift hashing method with Linear Probe as collision resolution technique.	
	B	Write a Program to implement Selection Sort	

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Roll No.: 13

Q1		**Attempt All**	**20**
	A	Write a program to implement Min Heap and Max Heap.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement stack using array(Any one operation and display appropriate message)	
	B	Write a program to implement Fold Boundary hashing method with Linear Probe as a collision resolution technique.	

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Roll No.: 11

Q1		**Attempt All**	**20**
	A	Write a program for Stack Application: Conversion of Infix to Postfix expression.	
Q2		**Attempt any one**	**10**
	A	Write a program to represent a graph using the Adjacency Matrix.	
	B	Write a program to implement Singly Linked List(Any one Operation)	

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Roll No.: 9

Q1		**Attempt All**	**20**
	A	Write a program to implement Circular Linked List(Any Four Operation)	
Q2		**Attempt any one**	**10**
	A	Find the shortest path in a graph (using any Algorithm such as Warshall's, etc.)	
	B	Write a Program to implement Quick Sort	

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Roll No.: 7

Q1		**Attempt All**	**20**
	A	Write a program to demonstrate application of linked list :Sparse Matrix	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Linear Search.	
	B	Write a program to implement Digit Extraction hashing method with Linear Probe as a collision resolution technique.	

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Roll No.: 5

Q1		**Attempt All**	**20**
	A	Write a program to implement Priority Queue using Array. ❏ Enqueue ❏ Dequeue ❏ Display	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort	
	B	Write a program to implement Direct hashing method with Linear Probe as collision resolution technique.	

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Roll No.: 3

Q1		**Attempt All**	**20**
	A	Write a program to implement Subtraction hashing method with Linear Probe as collision resolution technique.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Doubly Linked List(Any one Operation)	
	B	Write a program to implement Binary Search.	

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Roll No.: 1

Q1		**Attempt All**	**20**
	A	Write a program to implement a Circular queue using an array ❏ Enqueue ❏ Dequeue ❏ Display	
Q2		**Attempt any one**	**10**
	A	Write a C++ program to implement Double Ended Queue using Array(Any one Operation)	
	B	Write a Program to implement Insertion Sort	

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Roll No.: 40

Q1		**Attempt All**	**20**
	A	Linked List implementation of priority queue enqueue,dequeue,Print.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort	
	B	Implementation of Linked List Count no. of nodes and Reverse Linked List	

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LABORATORY MCAL11
[MCAL11: Lab Data Structures with C and / C++]

Duration: 2 hours **Marks:30 Marks**

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Roll No.: 39

Q1		**Attempt All**	**20**
	A	Queue Implementation using Linked List enqueue,Dequeue,Display	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Insertion Sort	
	B	Stack Array implementation Push,POP,Display,Peek.	

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Roll No.: 38

Q1		**Attempt All**	**20**
	A	Stack application:Evaluation of postfix expression	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort	
	B	Queue Array Implementation Insert,Delete,Display.	

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Roll No.: 28

Q1		**Attempt All**	**20**
	A	Circular Queue implementation using Linked List Insert, Delete,Display.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Shell Sort	
	B	Binary Search Tree Traversal Inorder,Preorder,Postorder	

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Roll No.: 29

Q1		**Attempt All**	**20**
	A	Stack Implementation using Linked List - Push,POP,Display.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort.	
	B	Implementation of searching algorithms Linear Search and Binary search.	

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Roll No.: 30

Q1		**Attempt All**	**20**
	A	Linked List implementation of Double ended queue enqueue,dequeue,Print.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Quick Sort	
	B	Operation on BST ● Largest Node ● Smallest Node ● Count number of nodes	

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Roll No.: 24

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Singly Linked Lists	
Q2		**Attempt any one**	**10**
	A	Write a program to implement radix sort	
	B	Implementation of Graph traversal DFS	

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Roll No.: 23

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Circular Linked List	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Insertion Sort	
	B	Implementation of Graph traversal BFS	

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Roll No.: 22

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Doubly Linked Lists	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort	
	B	Find the minimum spanning tree using Kruskal's Algorithm	

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Roll No.: 21

Q1		**Attempt All**	**20**
	A	Operation on BST ● Largest Node ● Smallest Node ● Count number of nodes ● Traversal (Inorder,Preorder,Postorder)	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort.	
	B	Find the minimum spanning tree using Prim's Algorithm	

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Roll No.: 31

Q1		**Attempt All**	**20**
	A	Write a program using Stack for Balancing of Parenthesis	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Bubble Sort	
	B	Write a program to implement Modulo Division method with Linear Probe as collision resolution technique.	

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Roll No.: 32

Q1		**Attempt All**	**20**
	A	Write a program to implement a Binary Search Tree with insertion, Traversal. find the total number of nodes, and leaf nodes in the binary tree.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement BFS using a Queue.	
	B	Write a Program to implement Shell Sort	

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Roll No.: 27

Q1		**Attempt All**	**20**
	A	Demonstrate application of linked list :Polynomial Addition	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Fold Shift hashing method with Linear Probe as collision resolution technique.	
	B	Write a Program to implement Selection Sort	

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Roll No.: 26

Q1		**Attempt All**	**20**
	A	Write a program to implement Min Heap and Max Heap.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement stack using array(Any one operation and display appropriate message)	
	B	Write a program to implement Fold Boundary hashing method with Linear Probe as a collision resolution technique.	

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Roll No.: 25

Q1		**Attempt All**	**20**
	A	Write a program for Stack Application: Conversion of Infix to Postfix expression.	
Q2		**Attempt any one**	**10**
	A	Write a program to represent a graph using the Adjacency Matrix.	
	B	Write a program to implement Singly Linked List(Any one Operation)	

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Roll No.: 33

Q1		**Attempt All**	**20**
	A	Write a program to implement Circular Linked List(Any Four Operation)	
Q2		**Attempt any one**	**10**
	A	Find the shortest path in a graph (using any Algorithm such as Warshall's, etc.)	
	B	Write a Program to implement Quick Sort	

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Roll No.: 34

Q1		**Attempt All**	**20**
	A	Write a program to demonstrate application of linked list :Sparse Matrix	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Linear Search.	
	B	Write a program to implement Digit Extraction hashing method with Linear Probe as a collision resolution technique.	

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Roll No.: 35

Q1		**Attempt All**	**20**
	A	Write a program to implement Priority Queue using Array. ❏ Enqueue ❏ Dequeue ❏ Display	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort	
	B	Write a program to implement Direct hashing method with Linear Probe as collision resolution technique.	

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Roll No.: 36

Q1		**Attempt All**	**20**
	A	Write a program to implement Subtraction hashing method with Linear Probe as collision resolution technique.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Doubly Linked List(Any one Operation)	
	B	Write a program to implement Binary Search.	

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Roll No.: 37

Q1		**Attempt All**	**20**
	A	Write a program to implement a Circular queue using an array ❏ Enqueue ❏ Dequeue ❏ Display	
Q2		**Attempt any one**	**10**
	A	Write a C++ program to implement Double Ended Queue using Array(Any one Operation)	
	B	Write a Program to implement Insertion Sort	

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Roll No.: 49

Q1		**Attempt All**	**20**
	A	Operation on BST ● Largest Node ● Smallest Node ● Count number of nodes ● Traversal (Inorder,Preorder,Postorder)	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort.	
	B	Find the minimum spanning tree using Prim's Algorithm	

UNIVERSITY OF MUMBAI
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M.C.A Semester – I
LABORATORY MCAL11
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Duration: 2 hours **Marks:30 Marks**

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Roll No.: 59

Q1		**Attempt All**	**20**
	A	Write a program to implement Priority Queue using Array. ❏ Enqueue ❏ Dequeue ❏ Display	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort	
	B	Write a program to implement Direct hashing method with Linear Probe as collision resolution technique.	

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Roll No.: 48

Q1		**Attempt All**	**20**
	A	Stack application:Evaluation of postfix expression	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort	
	B	Queue Array Implementation Insert,Delete,Display.	

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Roll No.: 55

Q1		**Attempt All**	**20**
	A	Circular Queue implementation using Linked List Insert, Delete,Display.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Shell Sort	
	B	Binary Search Tree Traversal Inorder,Preorder,Postorder	

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Roll No.: 60

Q1		**Attempt All**	**20**
	A	Stack Implementation using Linked List - Push,POP,Display.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort.	
	B	Implementation of searching algorithms Linear Search and Binary search.	

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Roll No.: 50

Q1		**Attempt All**	**20**
	A	Linked List implementation of Double ended queue enqueue,dequeue,Print.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Quick Sort	
	B	Operation on BST ● Largest Node ● Smallest Node ● Count number of nodes	

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Roll No.: 47

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Singly Linked Lists	
Q2		**Attempt any one**	**10**
	A	Write a program to implement radix sort	
	B	Implementation of Graph traversal DFS	

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Roll No.: 46

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Circular Linked List	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Insertion Sort	
	B	Implementation of Graph traversal BFS	

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Roll No.: 44

Q1		**Attempt All**	**20**
	A	Implementation of Insert, Display, Delete, Search, Count Reverse operation on Doubly Linked Lists	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Selection Sort	
	B	Find the minimum spanning tree using Kruskal's Algorithm	

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Roll No.: 57

Q1		**Attempt All**	**20**
	A	Linked List implementation of priority queue enqueue,dequeue,Print.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Radix Sort	
	B	Implementation of Linked List Count no. of nodes and Reverse Linked List	

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Roll No.: 41

Q1		**Attempt All**	**20**
	A	Write a program using Stack for Balancing of Parenthesis	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Bubble Sort	
	B	Write a program to implement Modulo Division method with Linear Probe as collision resolution technique.	

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Roll No.: 58

Q1		**Attempt All**	**20**
	A	Write a program to implement a Binary Search Tree with insertion, Traversal. find the total number of nodes, and leaf nodes in the binary tree.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement BFS using a Queue.	
	B	Write a Program to implement Shell Sort	

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Roll No.: 56

Q1		**Attempt All**	**20**
	A	Demonstrate application of linked list :Polynomial Addition	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Fold Shift hashing method with Linear Probe as collision resolution technique.	
	B	Write a Program to implement Selection Sort	

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Roll No.: 51

Q1		**Attempt All**	**20**
	A	Write a program to implement Min Heap and Max Heap.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement stack using array(Any one operation and display appropriate message)	
	B	Write a program to implement Fold Boundary hashing method with Linear Probe as a collision resolution technique.	

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Roll No.: 42

Q1		**Attempt All**	**20**
	A	Write a program for Stack Application: Conversion of Infix to Postfix expression.	
Q2		**Attempt any one**	**10**
	A	Write a program to represent a graph using the Adjacency Matrix.	
	B	Write a program to implement Singly Linked List(Any one Operation)	

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Roll No.: 45

Q1		**Attempt All**	**20**
	A	Write a program to implement Circular Linked List(Any Four Operation)	
Q2		**Attempt any one**	**10**
	A	Find the shortest path in a graph (using any Algorithm such as Warshall's, etc.)	
	B	Write a Program to implement Quick Sort	

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Roll No.: 52

Q1		**Attempt All**	**20**
	A	Write a program to demonstrate application of linked list :Sparse Matrix	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Linear Search.	
	B	Write a program to implement Digit Extraction hashing method with Linear Probe as a collision resolution technique.	

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Roll No.: 54

Q1		**Attempt All**	**20**
	A	Queue Implementation using Linked List enqueue,Dequeue,Display	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Insertion Sort	
	B	Stack Array implementation Push,POP,Display,Peek.	

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Roll No.: 53

Q1		**Attempt All**	**20**
	A	Write a program to implement Subtraction hashing method with Linear Probe as collision resolution technique.	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Doubly Linked List(Any one Operation)	
	B	Write a program to implement Binary Search.	

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Roll No.: 43

Q1		**Attempt All**	**20**
	A	Write a program to implement a Circular queue using an array ❏ Enqueue ❏ Dequeue ❏ Display	
Q2		**Attempt any one**	**10**
	A	Write a C++ program to implement Double Ended Queue using Array(Any one Operation)	
	B	Write a Program to implement Insertion Sort	

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Roll No.: 63

Q1		**Attempt All**	**20**
	A	Write a program to demonstrate application of linked list :Sparse Matrix	
Q2		**Attempt any one**	**10**
	A	Write a program to implement Linear Search.	
	B	Write a program to implement Doubly Linked List(Any one Operation)	

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Practical Examination – March 2022
M.C.A Semester – I
LABORATORY MCAL11
[MCAL11: Lab Data Structures with C and / C++]

Duration: 2 hours **Marks:30 Marks**

General Instructions:

- A practical consists of two Questions:
  - Q1 consists of 20 marks.
  - Q2 consists of 10 marks.
- Viva will be taken at the time of practical as well as after the practical if required.
- The figures to the right indicate full marks.
- Create a file with the name in the folder "MCA_SEM_I_2022"on the desktop which will have code as well as output a screenshot in it and upload the same file in the Google classroom.
- File Name must be **"Roll_number__Name of the stuent_subject name_date**)
- (**eg.65_XYZ_DSL_21032022**)
- If you are using any additional information, state it clearly.
- Single file(PDF format only) must be submitted as an assignment in Google Classroom by each student.
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- External Examiners may tell you to share your screen at any given movement.

Roll No.: 61

Q1		**Attempt All**	**20**
	A	Demonstrate application of linked list :Polynomial Addition	
Q2		**Attempt any one**	**10**
	A	Write a program to implement stack using array(Any one operation and display appropriate message)	
	B	Write a program to implement Fold Boundary hashing method with Linear Probe as a collision resolution technique.	

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Roll No.: 62

Q1		**Attempt All**	**20**
	A	Stack Implementation using Linked List - Push,POP,Display.	
Q2		**Attempt any one**	**10**
	A	Write a Program to implement Bubble Sort.	
	B	Implementation of searching algorithms Linear Search and Binary search.	

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