NIRMA UNIVERSITY
INSTITUTE OF
TECHNOLOGY
CE&IT DEPARTMENT
SEMESTER: IV, CE/IT
CE403 - DATA STRUCTURES

List of Practical

Sr. No.	Topic	Hour (s)	CLO
1.	**Array and Stack** a) Implement a program which checks whether multiplication AxB of a given [3x1] vector A stored in column major order and a [3x3] matrix B stored in column major order is possible or not. If not, then use appropriate technique to make the above multiplication possible. b) Implement the basic stack operations using an array.	04	CLO2, CLO4
2.	Implement a program to convert fully parenthesized infix expression to postfix expression.	04	CLO4
3.	**Queue** a) Implement circular Queue operations: Insertion, Deletion. b) Implement priority queue. c) Waiting line simulation in a post office: * In a post office, a loan postal worker serves a single queue of customers. Every customer receives a token # (serial number) as soon as he/she enters the queue. After service, the token is returned to the postal worker and the customer leaves the queue. At any point of time the worker may want to know how many customers are yet to be served. Implement the above system using an appropriate queue data structure, simulating a random arrival and departure of customers after service completion.	04	CLO4
4.	**Linked List** a) Implement Traversal, Insertion and Deletion operations on Circular linked list. b) Implement a program to reverse a singly linked list.*	02	CLO4
5.	**Linked List** a) Implement Traversal, Insertion and Deletion operations on doubly linked list. b) Implement an addition of two polynomial equations using linked list.	04	CLO4
6.	**Sorting** Implement Quick sort for sorting a given set of integers in ascending order.	02	CLO3
7.	a) Implement Heap sort algorithm for sorting a given list of integers in ascending order. b) Implement heap sort with the assumption that the smallest element of the list floats to the root during the construction of heap. *	02	CLO3
8.	**Searching** Implement Binary search operation on a given set of integers.	02	CLO3

9.	**Tree** a) Implement the following operations on given binary search tree : Insert a node, Delete a node & Traverse the tree (Inorder, Preorder, Postorder) b) For a given AVL tree T and a data item X, implement a program which split the AVL tree into two AVL trees T_1, T_2 such that all the keys in tree T_1 are less than or equal to X and all the keys in tree T_2 are greater than X respectively.	**06**	**CLO4**
10.	**Graph** Implement an algorithm to obtain a spanning tree of a connected undirected graph using appropriate data structure.	**02**	**CLO2, CLO4**
	Total	**32**	

*** indicates extra exercises for practice.**