

## DATA STRUCTURES LAB

### COURSE OUTCOMES (COS):

1. To choose and implement efficient data structures and apply them to solve problems.
2. To create data structures and to manipulate data within it using operations like sorting, searching, insertion, deletion and traversal.
3. To get hands on expertise in implementing different techniques for each data structures

### Write, and execute C program for the following:

1. Write a program to insert and delete an element into an array {2,34,56,7,8,9,22}.
2. Given {4,7,3,2,1,7,9,0} find the location of 7 using Linear and Binary search and also display its first occurrence.
3. Given {5,3,1,6,0,2,4} order the numbers in ascending order using Bubble Sort Algorithm.
4. Perform the Insertion and Selection Sort on the input {75,8,1,16,48,3,7,0} and display the output in descending order.
5. Perform the divide and conquer technique for quick sort on the input {70,80,10,6,8,38,0,2} and display the output in ascending order.
6. Write a program to insert the elements {61,16,8,27} into singly linked list and delete 8,61,27 from the list. Display your list after each insertion and deletion.
7. Write a program to insert the elements {61,16,8,27} into linear queue and delete three elements from the list. Display your list after each insertion and deletion.
8. Write a program to insert the elements {61,16,8,27} into ordered singly linked list and delete 8,61,27 from the list. Display your list after each insertion and deletion.
9. Write a program to add  $6x^3+10x^2+0x+5$  and  $4x^2+2x+1$  using linked list.
10. Write a program to push 5,9,34,17,32 into stack and pop 3 times from the stack, also display the popped numbers.
11. Write a recursive program to perform Tower of Hanoi.
12. Write a program to insert the elements {5,7,0,6,3,9} into circular queue and delete 6,9 and 5 from it (using linked list implementation).
13. Write a program to convert an infix expression  $x^y/(5*z)^2$  to its postfix expression.
14. Write a program to evaluate a postfix expression  $53+8^2-*$ .
15. Write a program to create a binary tree with the elements {18,15,40,50,30,17,41} after creation insert 45 and 19 into tree and delete 15,17 and 41 from tree. Display the tree on each insertion and deletion operation.

16. Write a program to create binary search tree with the elements {2,5,1,3,9,0,6} and perform inorder, preorder and post order traversal.
17. Write a program to Sort the following elements using heap sort {9,16,32,8,4,1,5,8,0}.