

# Netaji Subhash Engineering College

## Department of Information Technology Data Structure and Algorithm Lab(CS-392)

### 2015 odd semester.

- Q1. A) Write a program to implement Matrix multiplication.  
B) Write a program to implement Tower Of Hanoi problem.
- Q2. Write a program of implementation of the following functions in an array:  
a) Insert an element into a specific position.  
b) Delete an element from a specific position.
- Q3. Write a program to implement the following operations on a STACK using Array:  
a) PUSH                      b) POP                      c) DISPLAY
- Q4. Write a program to implement the following operations on a LINEAR QUEUE using Array:  
a) INSERT                      b) DELETE                      c) DISPLAY
- Q5. Write a program to implement the following operations on a CIRCULAR QUEUE using Array:  
a) INSERT                      b) DELETE                      c) DISPLAY
- Q6. WAP to convert the following expression to its postfix equivalent using stack  
a.  $((A + B) * D) ^ (E - F)$   
b.  $A + (B * C - (D / E ^ F) * G) * H$  Where ^: raise to the power
- Q7. Write program to evaluate an user given Postfix expression.
- Q8. a. Write a program to sort an array using Insertion sort  
b. Write a program to sort an array using Bubble sort.
- Q9. a. Write a program to sort an array using Selection sort  
b. Write a program to sort an array using Insertion sort.
- Q10. Write a program to search an element using Interpolation Search algorithm.
- Q11. Write a program to search an element using Binary Search algorithm.
- Q12. Write a program to search an element using Linear Search algorithm.
- Q13. Write a program to display FIBONACCI series and FACTORIAL of a number using recursion.
- Q14. Write a program to sort n numbers using function by the Quick Sort methods.
- Q15. WAP to implement linear queue using array and linked list.
- Q16. WAP to implement circular queue using array and linked list.

Q17. WAP to declare a priority queue using two-dimensional array, store elements and priority. Display the elements according to priority from higher to lower.

Q18. Write a menu driven program to perform the following operations on a singly linked list.

- c. Create
- d. Insert
- e. Delete
- f. Display
- g. Exit.

Q19. . Write a menu driven program to perform the following operations on a doubly linked list.

- a. Create
- b. Insert
- c. Delete
- d. Display
- e. Exit.

Q20. WAP to count the no. of leaf nodes in a binary tree.

Q21. Implement a menu driven program to perform the following operations on a binary search tree:

- f. Construct a BST (Construction begins from an empty tree)
- g. Insert element(s) into a non empty BST
- h. Delete element(s) from a non empty BST
- i. Search for an element in a BST
- j. Traverse in inorder, preorder, postorder.

Q22. WAP to input a graph  $G = (V, E)$  as an adjacency matrix. Include functions to

- k. Test if  $G$  is complete.
- l. Obtain the degree of a node  $u$ , if  $G$  is undirected, and indegree and outdegree of node  $u$  if  $G$  is directed.

Q23. WAP to input a graph  $G = (V, E)$  as an adjacency list. Include two functions BFT and DFT to undertake breadth first traversal and depth first traversal of the graph.

Q24. Write a programme to solve N-Queen problem.

Q25. WAP to store  $k$  keys into an array of size  $n$  at the location computed using a hash function,  $loc = key \% n$ , where  $k \leq n$  and  $k$  takes values from  $[1 \text{ to } m]$ ,  $m > n$ . To handle the collisions use the following collision resolution techniques,

- a. Linear probing
- b. Quadratic probing
- c. Double hashing/rehashing
- d. Chaining

Q26 . Implement the above program no. 25 using hash function Division methods.

Q27. Implement the above program no. 25 using hash function folding methods.