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**Department of Computer Science & Engineering**

**SUB : DATA STRUCTURES AND APPLICATIONS**

**MODULE 1 QUESTION BANK**

1. Write the Bubble sort Algorithm and Program.
2. Explain Dynamic memory Allocation.
3. Define Pointers. Give advantages and disadvantages of Pointers
4. Explain with example i) Insertion and ii)Deletion in an array
5. Differentiate between Structures and Union.
6. What do you mean by pattern matching? Let P and T be strings with lengths R and S respectively and are stored as arrays with one character per element. Write a Pattern Matching Algorithm that finds index P in T. Also discuss about this algorithm.
7. Write a program to i) reverse a String ii) concatenate two strings.
8. What is a Pointer? How do you declare and initialize a pointer? How do you access the value pointed to by a pointer.
9. What is String?Explain the following string functions with example.

i)STRCPY ii)STRCAT iii)SUBSTR

1. What is a Polynomial? What is the degree of the Polynomial? Write a function to add two polynomials.

**MODULE 2 QUESTION BANK**

1. Define Recursion. What are the properties recursions? Write recursive procedure for

a)Tower of Hanoi b) Factorial of a number.

1. Define Stack. Write the procedure for two basic operations associated with Stack.
2. Write an algorithm to Evaluate a Postfix expression. Evaluate the following postfix expression abc+\*de/- where a=5, b=6,c=2,d=12, e=4.
3. What is a Queue ? List different types of Queue.
4. Write C implementation of insert() and DeleteQ() operations.
5. Write the algorithm for Auckerman function. Evaluate A(1,2) using Auckerman function.
6. Explain in detail about Mazing Problem.
7. Explain with suitable example, how would you implement circular queue using dynamically allocated arrays.
8. Write the postfix form of the following expressions i)(a+b)\*d+e/(f+a\*d)+c

ii) ((a/b-c+d))\*(c-a)\*c)

1. List the disadvantages of a linear queue and explain how is it solved by using circular queue.

**MODULE 3 QUESTION BANK**

1. Define Linked List. Explain in detail the primitive operations formed on Linked List. List different types of Linked List.
2. Write the node structure to represent polynomial and write the function to add two polynomials.
3. Write C program to implement Stack
4. Write the following algorithm for SLL i)insert at first node ii) deleting the node with given item
5. Write C function for the following operations on Doubly Linked List.

i) Concatenation of two DLL ii) Search function for key element in DLL

1. Write algorithm to add two polynomials and to represent P(x,y,z)=6x2y2z-4yz=3x3yz+2xy2z-2xyz3
2. Write a short note on Header Linked List
3. Give Linked List representation of Sparse Matrix given below

0 0 4 0 0

6 5 0 0 0

0 3 0 1 0

0 0 0 0 2

1. For a given Sparse matrix write the diagrammatic LL representation

2 0 0 0

4 0 0 3

0 0 0 0

8 0 0 1

1. Write the following algorithm for SLL i)insert at first node ii) deleting the node with given item

**MODULE 4 QUESTION BANK**

1. What is a Tree? Write algorithm for tree traversal methods. Write the three traversal for the tree given below
2. Write a short note on Threaded Binary Tree? List the rules to construct a Threaded Binary tree.
3. Define Binary Search Tree. Construct BST for following step by step 100,85,45,55,110,20,70,65,113,145,132,96
4. Construct a binary tree expression for ((6+(3-2)\*5)^2+3).
5. Define Binary tree, complete binary tree, almost complete binary tree, binary search tree
6. Construct binary tree from the traversal order given below

Preorder:ABDEFCGHLJK

Inorder: DBFEAGCLJHK

1. With separate functions illustrate recursive search and iterative search of a binary search tree.
2. What is the advantage of Threaded binary tree? Explain the construction of threaded binary tree for 10.20.30.40,50.
3. Write a function to insert an item into an ordered BST.
4. Write the routines for creating a binary tree and deleting a node in a binary tree.

**MODULE 5 QUESTION BANK**

1. Explain in detail about static and dynamic Hashing
2. What is Hashing? Explain the different types of Hashing functions with example.
3. What is File Organization? Briefly summarize any three file organization techniques
4. Define Graph. Write the difference between trees and graph
5. Write an algorithm for BFS and DFS
6. How an Insertion sort works? Suppose an array A contains8 elements a s follows 77,33,11,44,88,22,66,55.Trace the algorithm.
7. Define the following terms i)Graph ii)Multigraph iii)Graph with self edge iv) subgraph.
8. What is Collision? What are the methods to resolve collision? Explain linear probing with example.
9. Write an algorithm for radix sort.
10. Give adjacency matrix and adjacency list representation for the graph.