



# MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)  
Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

## Department of Information Technology Question Bank - Academic Year (2021-22)

Course Code & Course Name : 19ITC01 & DATA STRUCTURES

Year/Sem/Sec : II/III/-

### DATA STRUCTURES INTRODUCTION

#### Unit-I: Part-A (2 Marks)

1. What do you mean by data structure? Give examples?
2. Write the features of arrays.
3. What is a pointer variable?
4. What is meant by actual and formal parameters?
5. Write a rule while declaring a structure.
6. What do you mean by dynamic memory allocation?
7. . What is a Structure?
8. How structure element can be accessed?
9. What is meant by two dimensional arrays?
10. . What is a linked list?

#### Part-B (16 Marks)

1. Explain the operations performed on doubly linked list (16)
2. Explain polynomial manipulation using linked list with an example (16)
3. Derive an ADT to perform insertion and deletion in a singly linked list (16)
4. Discuss about Application of Lists. (16)
5. Explain about Circular singly Linked List (8)  
Explain about Circular doubly Linked List (8)

### Unit-II : Stack and Queue

#### Part-A (2 Marks)

1. What are the different ways to implement list?
2. Define stack ADT.
3. What are the basic operations of stack ADT?

4. What is a Queue ?
5. Distinguish between Stack and Queue?
6. What is a Priority Queue?
7. Define the term: Circular Queue
8. When a Queue is said to be full and one entry?
9. List the applications of Queues
10. Convert the following infix expression into postfix expression?

**Part-B (16 Marks)**

1. . Explain the process of conversion from Infix expression to postfix expression using Stack. (16)
2. Discuss the algorithm for push and pop operation on a stack ADT. (16)
3. Discuss the algorithm for insertion and deletion on queue ADT (16)
4. Explain about applications of stack. (16)
5. Explain about applications of Queue (8)

**Unit-III : Tree and Binary Search Tree**

**Part-A (2 Marks)**

1. List out the disadvantages of Binary search tree.
2. Define AVL Tree. Give Example.
3. Define Amortized analysis
4. What are the Binary Tree Traversals?
5. Define Balance factor.
6. Define Binary Search Tree?
7. Define AVL Tree
8. Define: Balance factor of the AVL Tree.
9. List the various rotations in AVL Trees?
10. Give the properties of a B-Tree of order M

**Part-B (16 Marks)**

1. Discuss how to insert an element in an AVL tree. Explain with algorithm. (16)
2. What is B-Tree? Explain its properties. Analyze the linear search algorithm with an example. (16)
3. What is an AVL tree? Explain the rotations of an AVL tree. (16)
4. Explain the binary heap in detail (16)
5. Explain accounting method With example (16)

**Unit-IV : Graphs**  
**Part-A (2 Marks)**

1. Define Graph.
2. Define adjacent nodes.
3. What is a directed graph?
4. What is a undirected graph?
5. What is a loop?
6. What is a simple graph?
7. What is a weighted graph?
8. Define outdegree of a graph.
9. Define indegree of a graph
10. . Define path in a graph?

**Part-B (16 Marks)**

1. Explain the breadth first search algorithm. (16)
2. Write and explain the Prim's algorithm with an example (16)
3. . With an example, explain how will you measure the efficiency of an algorithm. (16)
4. 4. Analyze the linear search algorithm with an example. (16)
5. Explain Dijkstra's algorithm and solve the single source shortest path problem with an example (16)

**Unit-V : SECURITY,STANDARDAND APPLICATION**

**Part-A (2 Marks)**

1. What is meant by Sorting and searching?
2. What are the types of sorting available in C
3. Define Bubble sort.
4. Mention the various types of searching techniques in C
5. What is linear search?
6. What is binary search?
7. Define merge sort
8. Define insertion sort
9. Define selection sort
10. What is the basic idea of shell sort?

**Part-B (16 Marks)**

1. Explain technique of merge sort with an example. (16)
2. Explain technique of insertion sort with an example (16)
3. Explain clearly about collisions. (16)
4. Write short notes on hashing and the various collision resolution techniques (16)
5. Write an algorithm to sort of 'N' Numbers using quick sort. Trace the algorithm for the following set of numbers: 88,11,22,44,66,99,32,67,54,10 (16)

**Course Faculty**

**HoD**