



DATA STRUCTURE AND ALGORITHMS

Combined Technical Service Examination

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Unit II: Data Structures and Algorithms (20 Questions)

List ADT – array based implementation – linked list implementation – singly linked lists – circularly linked lists – doubly-linked lists – applications of lists – Polynomial Manipulation – All operation (Insertion, Deletion, Merge, Traversal) – Stack ADT – Evaluating arithmetic expressions – other applications – Queue ADT – circular queue implementation – Double ended Queues – Priority Queues - application of queues – Trees: Binary Tree - Binary Search Tree-Tree Traversals – Sorting algorithms: Insertion sort – Selection sort – Shell sort – Bubble sort – Quick sort – Merge sort – Radix sort – Heap Sort - Searching: Linear search – Binary Search - Hashing: Hash Functions – Separate Chaining – Open Addressing – Rehashing – Extendible Hashing –



Unit II: Data Structures and Algorithms (20 Questions)

Graph Algorithms: Minimum Spanning Tree – Shortest Path Algorithms - Graph Traversals -Directed

Acyclic Graph- Topological Ordering-All Pair Shortest Path Algorithms- Floyd Warshall algorithm

Bellman Ford Algorithm-Network Flow Algorithms- Ford Fulkerson Algorithm- Algorithm Analysis:

Asymptotic Analysis-Solving Recurrence Equations-Algorithm Design Techniques-Greedy

AlgorithmsDynamic Programming-Divide and Conquer



1. List ADT:

- Array based implementation
- Linked list implementation
- Singly linked lists
- Circularly linked lists
- Doubly-linked lists
- Applications of lists



- Polynomial Manipulation
- All operation (Insertion, Deletion, Merge, Traversal)

2. Stack ADT:

- Evaluating arithmetic expressions
- Other applications



3. Queue ADT:

- Circular queue implementation
- Double ended Queues
- Priority Queues
- Application of queues



4. Tree:

- Binary Tree
- Binary Search Tree
- Tree Traversals



5. Sorting Algorithms:

- Insertion sort
- Selection sort
- Shell sort
- Bubble sort
- Quick sort
- Merge sort



- Radix sort
- Heap Sort



6. Searching Algorithms:

- Linear search
- Binary Search

7. Hashing:

- Hash Functions
- Separate Chaining



- Open Addressing
- Rehashing
- Extendible Hashing



8. Graph Algorithms:

- Minimum Spanning Tree
- Shortest Path Algorithms
- **9. Graph Traversals**
 - Directed Acyclic Graph
 - Topological Ordering
- All Pair Shortest Path Algorithms



- Floyd Warshall algorithm
- Bellman Ford Algorithm
- Network Flow Algorithms
- Ford Fulkerson Algorithm-



10. Algorithm Analysis:

- Asymptotic Analysis
- Solving Recurrence Equations
- Algorithm Design Techniques
- Greedy Algorithms
- Dynamic Programming
- Divide and Conquer



BASICS OF DSA



Data? Information?

Data Structure?

Data Types?

Array?

Linked List?

Stack?



Queue?

Tree?

Graph?

Algorithm? How to analyze and pick best Algorithm?



Thank You!