(16CS503) DATA STRUCTURES THROUGH C

UNIT-I

Discuss the following operations on One-Dimensional array with algorithms.

(i). Searching (ii). Sorting (iii). Traversing

2.Discuss the following operations on One-Dimensional array with algorithms.

(i). Merging (ii). Deletion

3.Write a detailed notes on

(i) Static representation of Single Linked List
(ii) Dynamic representation of Single Linked List

4. Discuss all types of Insertion operations on a S.L.L with algorithms.

5. Explain and write the algorithms for Searching & Merging operations on C.L.L.

6. Write and explain the algorithm for Sorting operations on C.D.L.L.

7. Write short notes on (i). Sparse matrix manipulation

(ii). Polynomial Addition.

8. Write short notes on (i). Polynomial Multiplication.

(ii). Pointer Array.

9. Explain about all types of Deletion operations onD.L.L.

10. Write short notes on the following concepts

(i). Sparse Matrix (ii). Comparison between arrays and Linked lists (iii). Advantages of Circular over Single Linked List.

UNIT-II

1. Write and explain the algorithm for Quick sort and apply the technique to sort the following elements

34 71 26 14 81 54 49

2. Explain the Tower of Hanoi problem containing 3 discs and write the algorithm to solve it.

3. How to convert an Infix expression into Postfix expression, explain through an example. Convert the following Infix expression to Postfix: **(A+B)^C-(D*E)/F.**Write the algorithm for it

4. Discuss the following representations of Stack

(i). Stack using Arrays (ii). Stack using Linked Lists

5. Discuss the various operations on a Stack using Arrays.

6. Discuss the INSERT and DELETE operations of a Queue using array with algorithms.

7. Define Circular Queue. How to insert and delete a node into and from it. Write algorithms for them.

8. Write a detailed notes on

(a).DEQUE (b). Priority Queue : with their representations.

9. Explain any two applications of Queue.

10. Explain and write algorithms that how queues can be implemented using arrays

UNIT-III

1 a) Define the following terms with representations

i)Binary Tree II) Binary Search Tree

b) How to represent a binary tree using Linked List explain it?

2. Discuss the insertion and deletion on a Binary Tree?

3. Write about Traversal Operations on a Binary Tree with algorithms?

4. Discuss about traversal operation on a Binary search tree write the algorithms for them

5. Construct a Max heap tree for the following elements and sort them in ascending order

76 69 5947 8599 98

6. Write and explain the algorithm for Heap sort.

7.Discuss the following in detail

a) Set Representation of a detail.

b) Linked List Representation of a Graph

8. Explain Depth-First- Search , Breadth-First-Search graph traversal operations?

9.HowWarshall's algorithm can be used to find the shortest path between nodes in a graph explain with an example?

10. How to do Topological Sorting on a directed acyclic graph, explain with an example?

UNIT-IV

1.Discuss the following Sorting techniques with example

i) Straight Insertion Sort

ii) List Insertion Sort

2.Write and explain the algorithm for Straight Select ion Sort.Explain with an example?

3.What is the logic behind Heap sort and sort the following elements

12 98 67 44 88 70

4. Discuss the Bubble sort algorithm and sort the following elements using it.

12 98 67 44 88 70

5. Apply Divide-and-Conquer method to implement Quick sortand sort the following elements write the algorithm for it

22 71 49 53 7

6. Apply partition method to implement Quick sort and sort the following elements

52 48 91 33 19 67

7. Write a detailed writes on sorting by Merging ?

8. Write short notes on

a. Simple Merging b. Binary Merge.

9. What is the logic behind in Internal Merge sort? Discuss in detail?

10. Write a detailed notes on External Merge sort?

UNIT-V

1. Write and explain the algorithm for Linear search using arrays?
2. Write and discuss the algorithm for Binary search through an example?
3. What is Hash table and explain any two Hash functions with an example?
4. What is collision resolution?Discuss the different techniques of it?
5. Write and explain the algorithm for Linear search using linked list?
6. How Fibonacci search is better than binary search. Write the algorithm for Fibonacci search?
7. Discuss the concept of hashing with an example?
8. What is the drawback of closed hashing? Discuss any two remedies for it?
9. Write a short notes on : A. Open Hashing. B. Closed Hashing?
10. Compare the process of Linear search using array and linked list?