Data Structure

Important Questions

<u>Section A</u>

1. Explain Asymptotic notations for complexity.

2. What are queues? Write insert and delete routines for it.

3. What is Data Structure? Describe various types of data structures briefly with suitable examples.

4. What are priority queues? Discuss different implementation schemes for priority queues.

5. Define stack. Develop an algorithm to implement various operations on stack.

6. What is an array? Discuss the various operations that are allowed on array data structure. Describe the formula for calculating the address of any element of a two dimensional array.

7. Explain Binary search algorithm and compare it with linear search algorithm.

8. Write merge sort algorithm and derive the expression for its run time complexity in best, average and worst case.

9. Describe insertion sort algorithm and trace the steps of insertion sort for sorting the list 12,19,33,26,29,35,22. Find the total number of comparison made.

10. What are heaps? write algorithm heap sort and determine its time complexity.

<u>Section B</u>

1. Write an algorithm to search a given value into linked list.

2. Develop an algorithm to insert and delete an element from any position of a circular singly linked list.

3. Write an algorithm to insert an element at middle position in doubly linked list.

4. Implement queue operations using linked list along with algorithms.

5. Describe Circular linked list in detail.

6. What is stack? Write push and pop routines for dynamically implemented stack.

7. What do you understand by dynamic memory management.

8. Write an algorithm to count no of nodes in linked list.

9. How we de-allocate memory space using pointers in C.

10. Give applications of Linked list.

Section C

1. What are binary trees? Write an algorithm to count number of nodes in binary tree.

2. What is binary search tree? Write an algorithm to search a value in binary search tree.

3. How trees are used to represent postfix and prefix expressions? Explain briefly with examples.

4. What is threaded binary tree? Discuss with the help of examples.

5. Write an algorithm that inserts an edge into an undirected graph represented using an adjacency matrix.

6. What are connected components of a graph? Write a method to find out all connected components of a graph.

7. What is meant by traversal of graph/Discuss Breadth first traversal technique with the help of example.

8. Write an algorithm to convert infix expression into equivalent postfix expression.

9. What is minimum spanning tree.

10. Discuss various techniques of graph representation with their relative merits and demerits.

Section D

1. Explain the difference between AVL and B tree.

2. Explain the various collision resolution techniques.

3. Describe the AVL trees insertion and deletion method.

4. How an AVL tree differs from a BST.

5. What are the different methods of opening a file? Explain in brief.

6. Write a program which counts the number of recored in a given file.

7. Differentiate between fwrite () and fput() functions.

8. What is a skip list? What is the necessity of adding extra links.

9. Write an algorithm that searches a key in a skip list.

10. Define set data structure.How are they different from arrays? Give examples to show the applications of the set Data structure.