B.Sc. III Sem.

Data Structures

Important Topics

Unit-I:

1. Define Data Structure. What are the types of Data Structures?
2. What is Algorithm and Pseudocode?
3. Define Stack. Explain Stack operations with an example.
4. Write a C++ program for Stack ADT using array.
5. Explain Arithmetic Expression evaluation with an example.
6. Define Recursion with an example.

Unit-II:

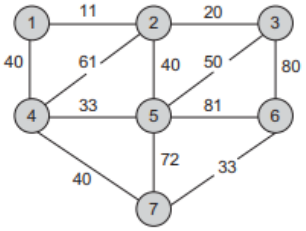
7. Compare Recursion vs Iteration
8. Define Queue. Explain Queue operations with an example.
9. Write a C++ program for Queue ADT using array.
10. Compare Double-Ended Queue vs Circular Queue.
11. Define Linked List. Explain its types.
12. Explain various Linked List operations.

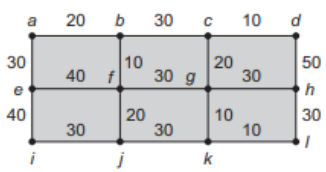
Unit-III:

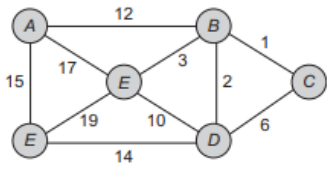
13. Explain various terms of Tree.
14. Define Binary Tree and its operations
15. Explain pre-order, in-order and post-order of Tree traversal.
16. What are Binary Tree properties and Binary Tree Applications?
17. Sorting Techniques (Internal Sorting – (a),(b),(c),(d) & External Sorting-(e))
    (a) Bubble Sort (b) Selection Sort (c) Insertion Sort (d) Quick Sort (e) Merge Sort
18. Write C++ programs for Q.17
19. Sort the following list for Q.17
    (a) 76,67,36,55,23,14,6
    (b) 25,57,48,37,12,92,86,33
    (c) 3,1,4,1,5,9,2,6,5,4
    (d) 7,23,31,40,56,78,9,2
20. Compare all sorting algorithms.
21. Explain AVL Tree with an example.

Unit-IV:

22. Explain various terms of Graph
23. Graph Traversal – (a) Depth First Search (DFS) (b) Breadth First Search (BFS)
24. Minimum Spanning Tree – (a) Prim's Algorithm (b) Kruskal's Algorithm.
    Solve the below Graphs using Prim's and Kruskal's Algorithms.







25. Define Hash Function with an example.
26. Collision Resolution Strategies in Heap – (a) Linear Probing (b) Quadratic Probing
27. Define Heap. Explain Min-Heap and Max-Heap.
28. Explain Heap Sort with an example.