

**Set A**

**Final Examination (2023)**

**BCA/Third Semester/CACS 201: Data Structures & Algorithms**

**Full Marks: 50  
Time: 2 hr 40 min**

**Group B**

**Attempt any SIX questions:**

**[6×5=30]**

2. How do you find complexity of algorithms? Explain.
3. Explain the infix to post fix conversion algorithm.
4. What is a linked list? Explain the different types of linked list with neat diagram.
5. What are the benefits of using linked list over array? How can you insert a node in a singly linked list?
6. Write recursive algorithm to get Fibonacci term. Illustrate it drawing recursive tree.
7. Insert the following sequence of keys in the hash table 50, 700, 76, 85, 92, 73 and 101 with the hash function  $h(k) = k \bmod 7$  using separate chaining and linear probing.
8. What is insertion sort? Trace and sort the following data using the insertion sorting algorithm. 90, 56, 80, 10, 22, 21, 45, 9.

**Group C**

**Attempt any TWO questions:**

**[2×10=20]**

9. Define a stack. Explain the different operation that can be performed on stack using C- functions and show them using diagrammatic representations.
10. Explain the procedure for construction of Huffman algorithm with example.
11. What is shortest path? Explain Dijkstra algorithm for finding shortest path using suitable example.

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2. Explain the operations of circularly linked lists.
3. What is priority queue? Why do you need this type of queue?
4. What is collision? What are the methods to resolve collision? Explain double hashing with an example.
5. What do you mean by sorting? Explain Quick Sort algorithm.
6. What is AVL Tree? Construct the AVL tree for the following set of data: 1,2,3,4,8,7,6,5,11,10,12
7. Insert the keys 78, 52, 81, 40, 33, 90, 85, 20 and 38 in this order in an initially empty B-tree of order 3.
8. Differentiate between Prim's and Kruskal's algorithm.

**Group C****Attempt any TWO questions:****[2×10=20]**

9. Differentiate between singly linked list and doubly linked list. How do you insert and delete a node from doubly linked list? Explain.
10. Define Binary tree with an example. Write C recursive routine to traverse the given tree using inorder, preorder and postorder.
11. Discuss depth first and breadth first traversal of a graph with suitable example.

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