



Daffodil International University
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Examination, Fall-2023

Course Code: CSE123, Course Title: Data Structures

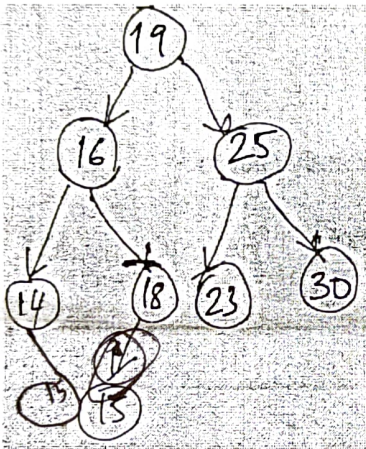
Level: 1 Term: 2 Batch: 61

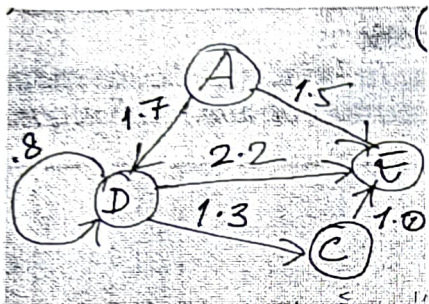
Time: 2 Hours

Marks: 40

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1	<p>Consider the following figure of a BST:</p>  <p>Answer the following questions:</p> <p>(A) Show the traversal of the tree using inorder, preorder and postorder traversal technique.</p> <p>(B) Suppose a new node having data 12 is to be inserted and node 18 is to be deleted, show the operation of insertion and deletion and elaborate briefly.</p> <p>(C) Show the implementation scheme using link list nodes for the above BST.</p> <p>(D) Why BST is popular in computing.</p>	4 3 2 2	CO2 CO2 CO2 CO1
2	<p>(A) A given set of data in an array is {13, 15, 17, 19, 24, 9, 11, 14, 8, 5}. Insert the above data in an empty AVL tree and show each step of AVL formation including rotations.</p> <p>(B) Why AVL plays a significant role in data search using BST.</p>	8 2	CO2 CO1

3	<p>For the data set shown in an array {23, 15, 19, 6, 33, 45, 4, 55, 8, 22, 39, 2}, answer the following questions:</p> <p>(A) Form a minHeap and maxHeap and show each necessary intermediate tree. Identify total number of percolations needed for minHeap and maxHeap.</p> <p>(B) Suppose the node 15 is to be deleted in minHeap you have formed above, write the process of deletion for node 15.</p> <p>(C) How heap data structure is different from BST.</p> <p>(D) Why percolation is needed in Heap.</p>	4 3 2 2	CO2 CO2 CO1 CO1
4	<p>Consider the following Graph:</p>  <p>Answer the following questions:</p> <p>(A) Represent the graph using Adjacency matrix and Adjacency list</p> <p>(B) Why Graph data structure has significance in real-life.</p> <p>(C) How indegree and outdegree signifies using graph computing.</p>	4 2 2	CO2 CO1 CO1

Good Luck