

**FACULTY OF ENGINEERING, SCIENCE & TECHNOLOGY**

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| **Course Code/ Title:** | | **ASSESSMENT ACTIVITY:** | **Semester**: |
| Data Structures and Algorithms | | Assignment -01 |  |
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| **Final Date:**  15/09/2024 | | **OBE Target:** | **Weight of Marks:** |
| CLO-1& 2 and GAs 2 & 3 | 10% (10 Marks of Total) |
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| **Student Name:** | | **Teacher:** | **Score:** |
| **Student ID:** |  | Zubair Sajid |
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**Question # 01**

*Given the following sequence of integers: 55, 23, 72, 17, 34, 60, 85, perform the following operations:*

1. *Insert the numbers into a Binary Search Tree.*
2. *Perform an in-order traversal and list the numbers in sorted order.*
3. *Search for the number* ***60*** *and explain the path taken to find it in the BST.*

**Question # 02**

*Insert the following numbers into an empty AVL Tree: 40, 20, 50, 10, 30, 45, 55. After the insertion, delete the number* ***20*** *and show the tree structure after rebalancing. Also, explain the rotations (if any) performed during both insertion and deletion.*

**Question # 03**

*You are given a hash table of size 10, and the hash function is h(x) = x % 10. Insert the following keys into the hash table using* ***linear probing*** *for collision resolution:****Keys:*** *34, 87, 56, 92, 45, 12, 78  
Explain each insertion step and show the final hash table.*

**Examiner Signature:** **Student Score:**