**Họ và Tên: Trần Thị Ngọc Diệp**

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**Lớp: B2HK182 – Cấu Trúc Dữ Liệu và Giải Thuật**

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**TUT 6**

**Question 1: Construct the AVL tree:**

**20, 12, 44, 35, 75, 21, 30, 33, 87, 6, 91, 15, 69**

|  |  |
| --- | --- |
| **Number** | **AVL tree** |
| **20** |  |
| **12** |  |
| **44** |  |
| **35** |  |
| **75** |  |
| **21** |  |
| **30** |  |
| **33** |  |
| **87** |  |
| **6** |  |
| **91** |  |
| **15** |  |
| **69** |  |

**Question 2:**

**Remove elements of AVL tree in question 1**

**75, 44, 69, 87, 91, 20**

|  |  |
| --- | --- |
| **Number** | **AVL tree** |
| **75** |  |
| **44** |  |
| **69** |  |
| **87** |  |
| **91** |  |
| **20** |  |

**Question 3:** **Construct a B-tree by inserting one by one elements as follows (Degree: 3)**

**20, 12, 44, 35, 75, 21, 30, 33, 87, 6, 91, 15, 69**

|  |  |
| --- | --- |
| **Number** | **B-tree** |
| **20** |  |
| **12** |  |
| **44** |  |
| **35** |  |
| **75** |  |
| **21** |  |
| **30** |  |
| **33** |  |
| **87** |  |
| **6** |  |
| **91** |  |
| **15** |  |
| **69** |  |

**Question 4: Remove elements of B-tree in question 3 step by step:**

**44, 33, 69**

|  |  |
| --- | --- |
| **Number** | **AVL tree** |
| **44** |  |
| **33** |  |
| **69** |  |

**Question 5:**

**The complexity of operations inserting and deleting one node in AVL, B-tree, BST for worst-case scenario:**

**AVL Tree:**

Insertion: O(log2N)

Deletion: O(log2N)

**B – Tree:**

Insertion: O(logN)

Deletion: O(logN)

**BST:**

Insertion: O(N)

Deletion: O(N)