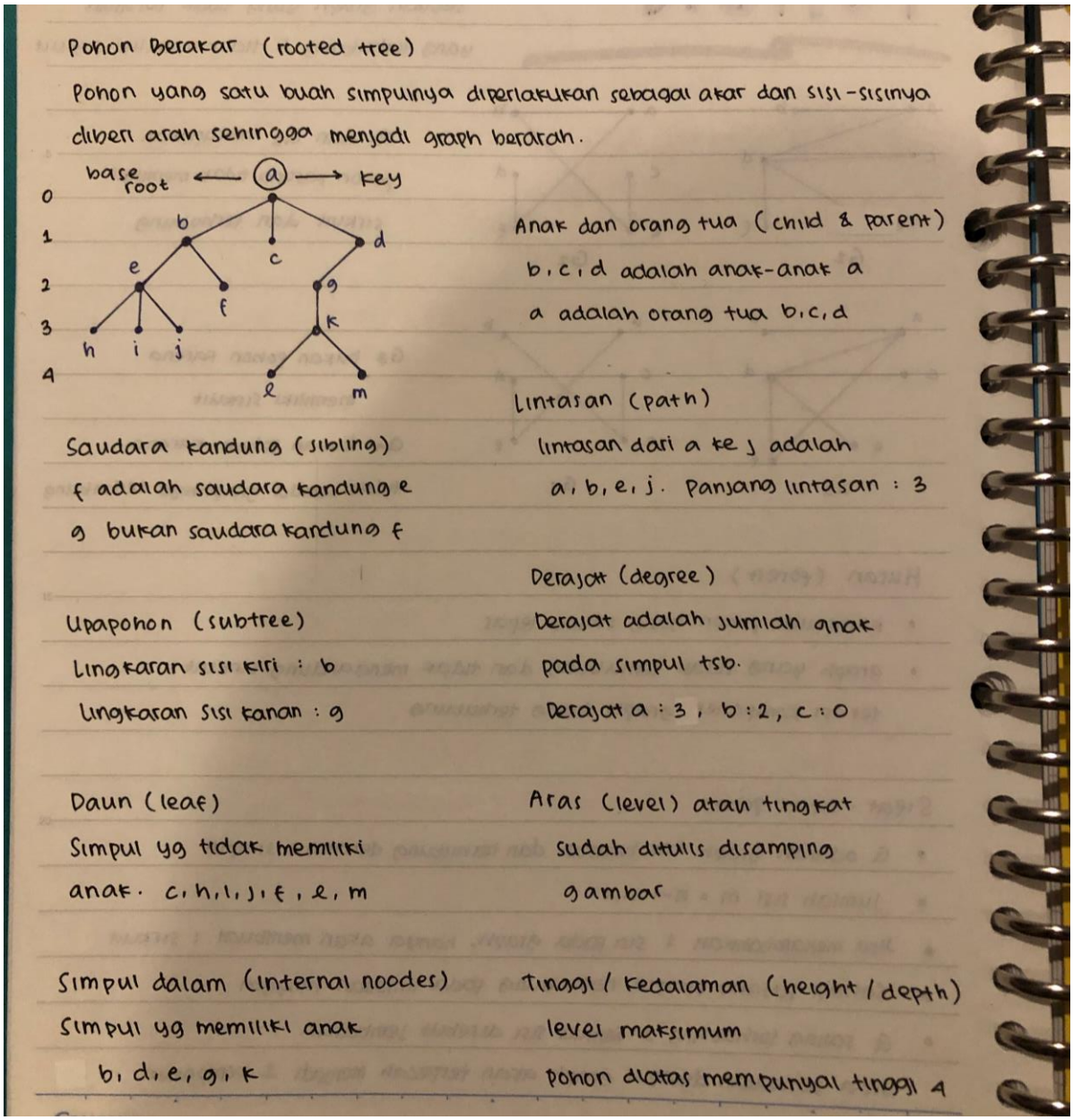
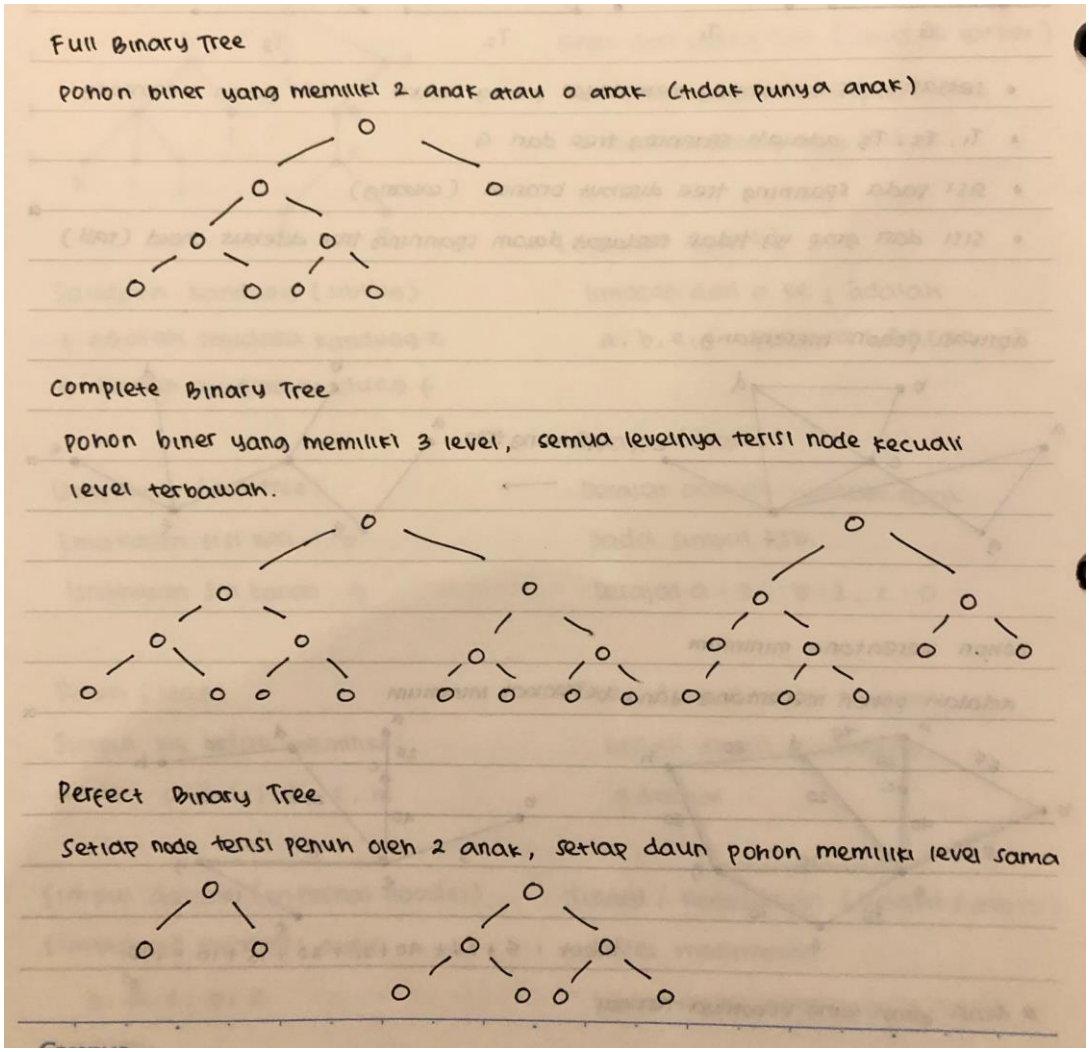
Anida Dewi Prahesti

1. Explain the differences between linear and non-linear data structure!
   Linear : Data elements are sequentially connected and each element is traversable through a single run
   Non-Linear : Data elements are hierarchically connected and are present at various levels

2. Describe the following terminology in a tree: base root, key, edge, siblings, parent, child, and leaf!



3. Explain the following types of binary trees: full, complete, and perfect!



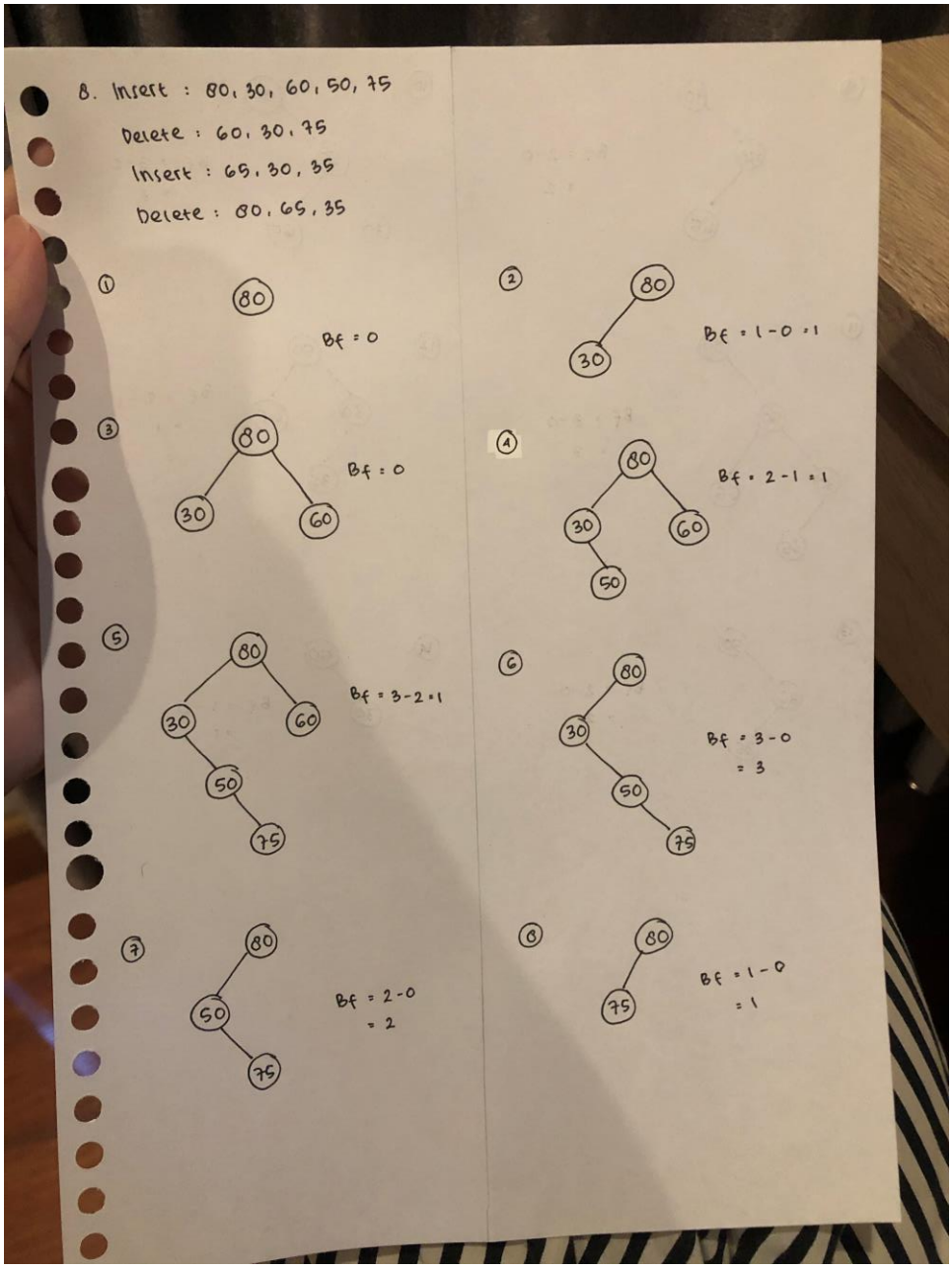
4. What makes a tree balanced?
   If the difference level or height between left subtrees and right subtrees less or equal to one.

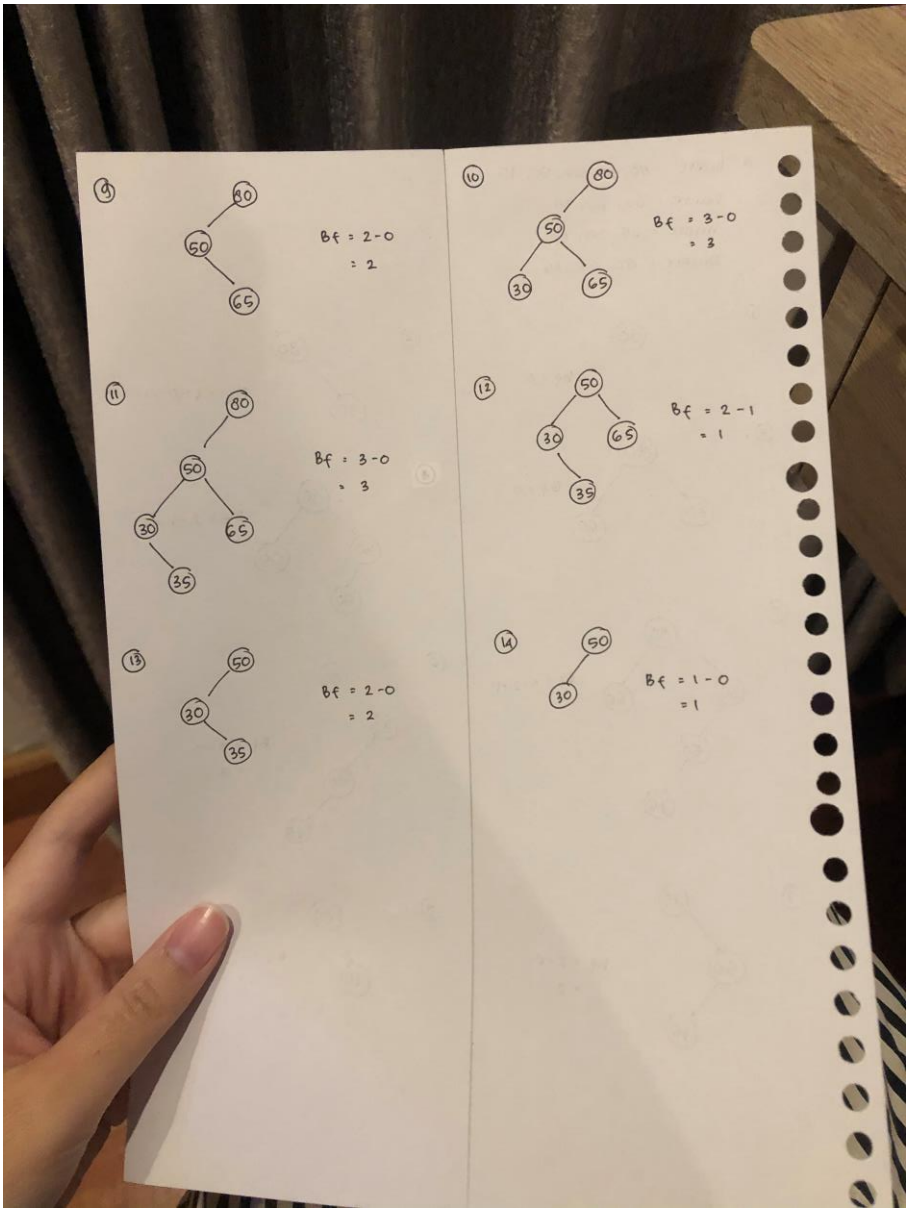
5. Explain the four properties of a binary tree!
   - Maximum number of nodes on level **K** is 2^k
   - Maximum number of nodes on a binary tree is (2^h+1)-1
   - Minimum height of a binary tree of *n* nodes is 2log(n)
   - Maximum height of a binary tree of *n* nodes is *n*-1

6. Explain the intuition of implementing a binary tree using an array!
   - index for left tree = 2*parent+1
   - index for left tree = 2*parent+2
   - index for itself = 2*parent

7. Explain the differences between inorder successor and inorder predecessor!
   When you do the inorder traversal of a binary tree, the neighbors of given node are called Predecessor (the node lies behind of given node) and Successor (the node lies ahead of given node).

8. Draw the following binary search tree step by step (14 pictures):
   - Insert 80, 30, 60, 50, 75
   - Delete 60, 30, 75
   - Insert 65, 30, 35
   - Delete 80, 65, 35




9
80
50
65
Bf = 2-0
= 2
10
80
50
30
65
Bf = 3-0
= 3
11
80
50
30
65
35
Bf = 3-0
= 3
12
50
30
65
35
Bf = 2-1
= 1
13
50
30
35
Bf = 2-0
= 2
14
50
30
Bf = 1-0
= 1