

14CST31- DATA STRUCTURES

ASSIGNMENT 1

1. Convert the following infix expression into postfix expression and also evaluate the same. (5)

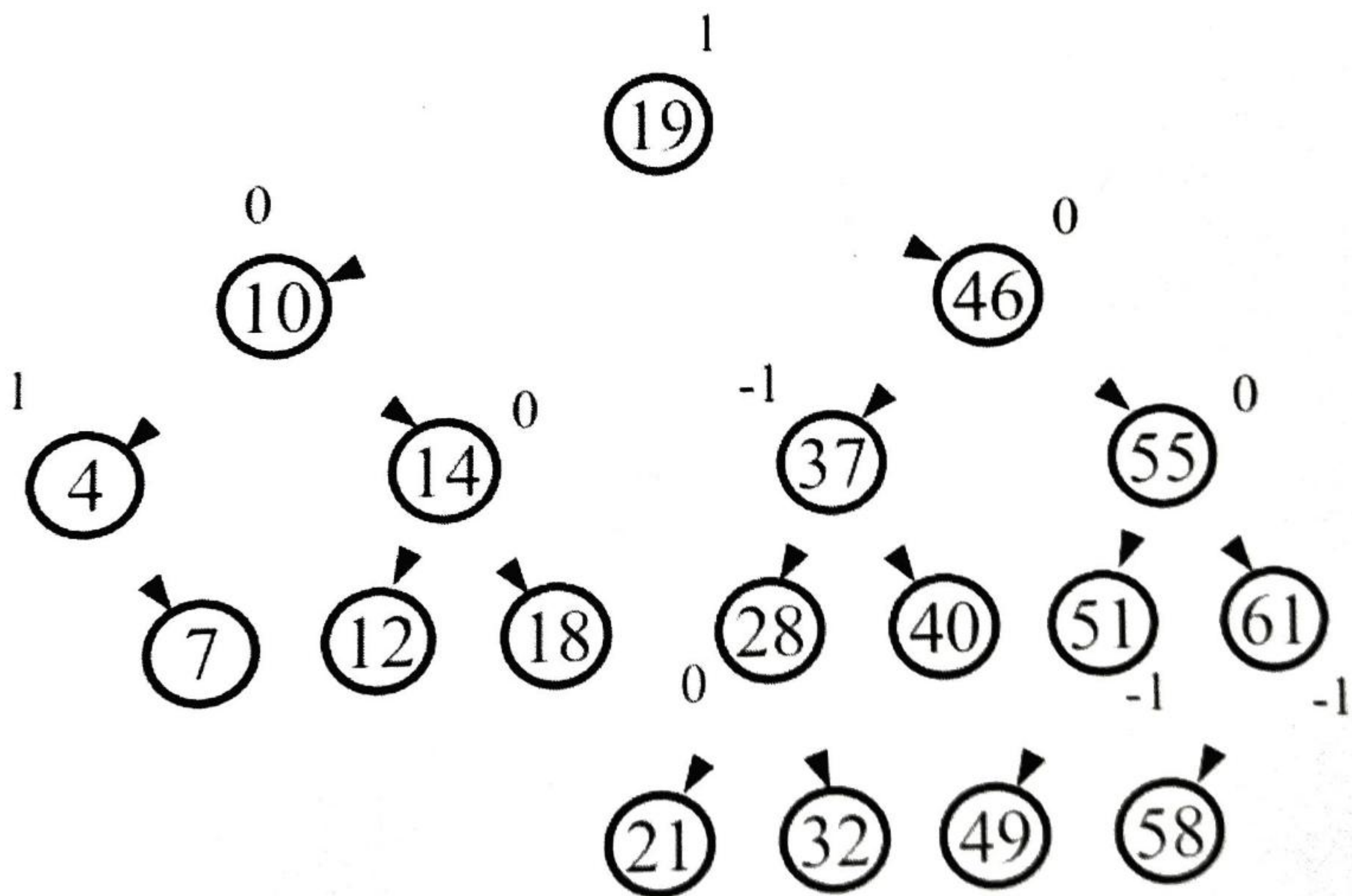
$$8/2^3+4*5-8*3$$

2. Construct the Binary Search Tree for the following data. (5)

25 50 15 22 18 35 31 44 70 90 10 4 12 24 66

3. Traverse the above Binary Search Tree using In-order, Pre-order and Post-order tree traversal. (6)

4. In the following AVL tree insert the numbers 11, 9, 6, 56, 20, 23 and delete 18, 58, 19, 28, 32. (9)



Assignment-2 Scheme

convert the following Infix expression to postfix expression and also Evaluate the same

(i) $8/2 \wedge 3 + 4 * 5 - 8 * 3$.

$$8 \quad \boxed{\quad} \quad 8 \quad 1 \quad \boxed{\quad / \quad} \quad 8 \quad 2 \quad \boxed{\quad / \quad} \quad 8 \quad 2$$

$$\wedge \quad \boxed{\quad \wedge \quad / \quad} \quad 8 \quad 2 \rightarrow 3 \quad \boxed{\quad \wedge \quad / \quad} \rightarrow + \quad \boxed{\quad \wedge \quad / \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1$$

$$+ \quad \boxed{\quad + \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \rightarrow 4 \quad \boxed{\quad + \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4 \quad * \quad \boxed{\quad * \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4$$

$$5 \quad \boxed{\quad + \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4 \quad 5 \rightarrow \boxed{\quad - \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4 \quad 5 \quad * \quad + \quad 8 \rightarrow \boxed{\quad - \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4 \quad 5 \quad * \quad + \quad 8$$

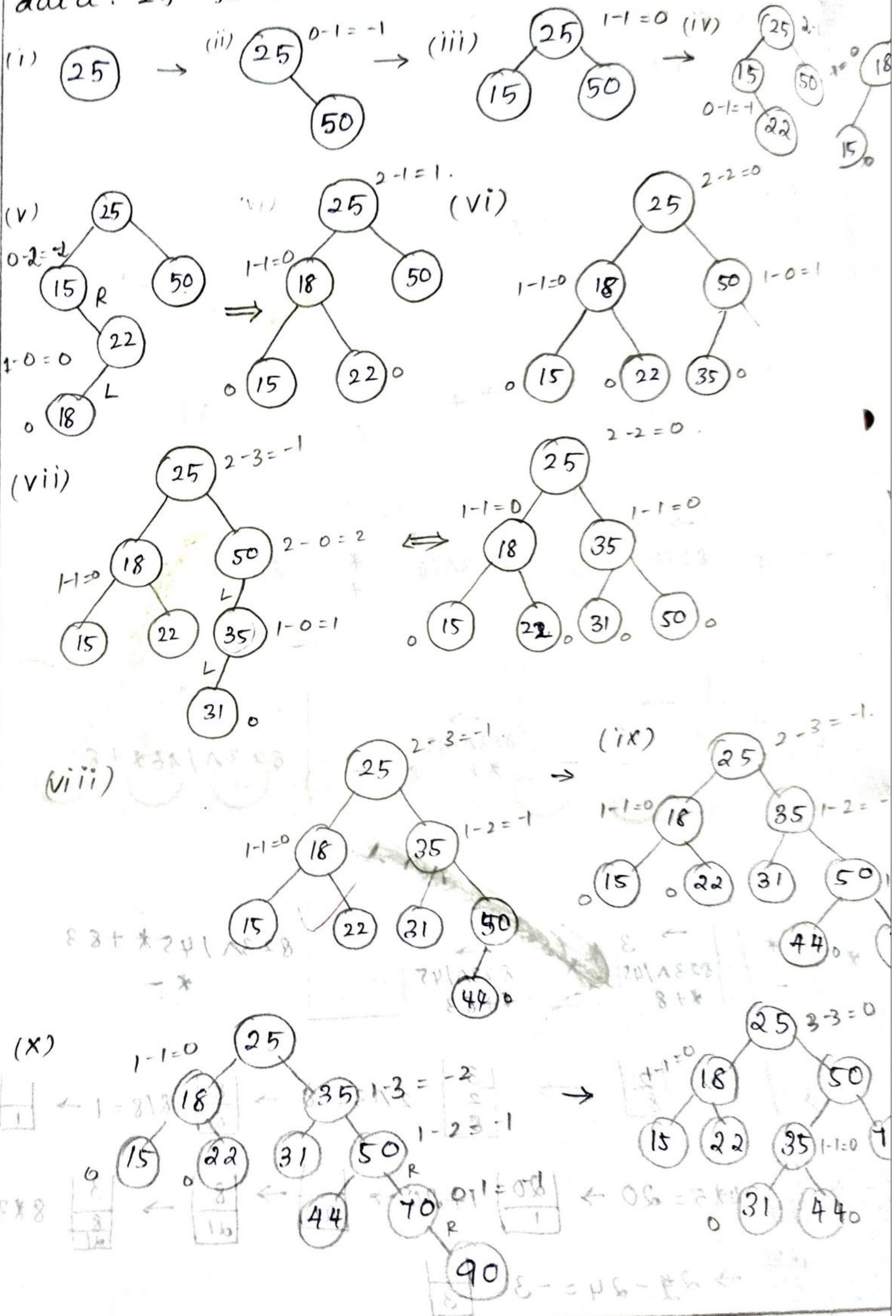
$$* \quad \boxed{\quad * \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4 \quad 5 \quad * \quad + \quad 8 \rightarrow 3 \quad \boxed{\quad * \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4 \quad 5 \quad * \quad + \quad 8 \quad 3 \rightarrow \boxed{\quad * \quad} \quad 8 \quad 2 \quad 3 \quad \wedge \quad 1 \quad 4 \quad 5 \quad * \quad + \quad 8 \quad 3$$

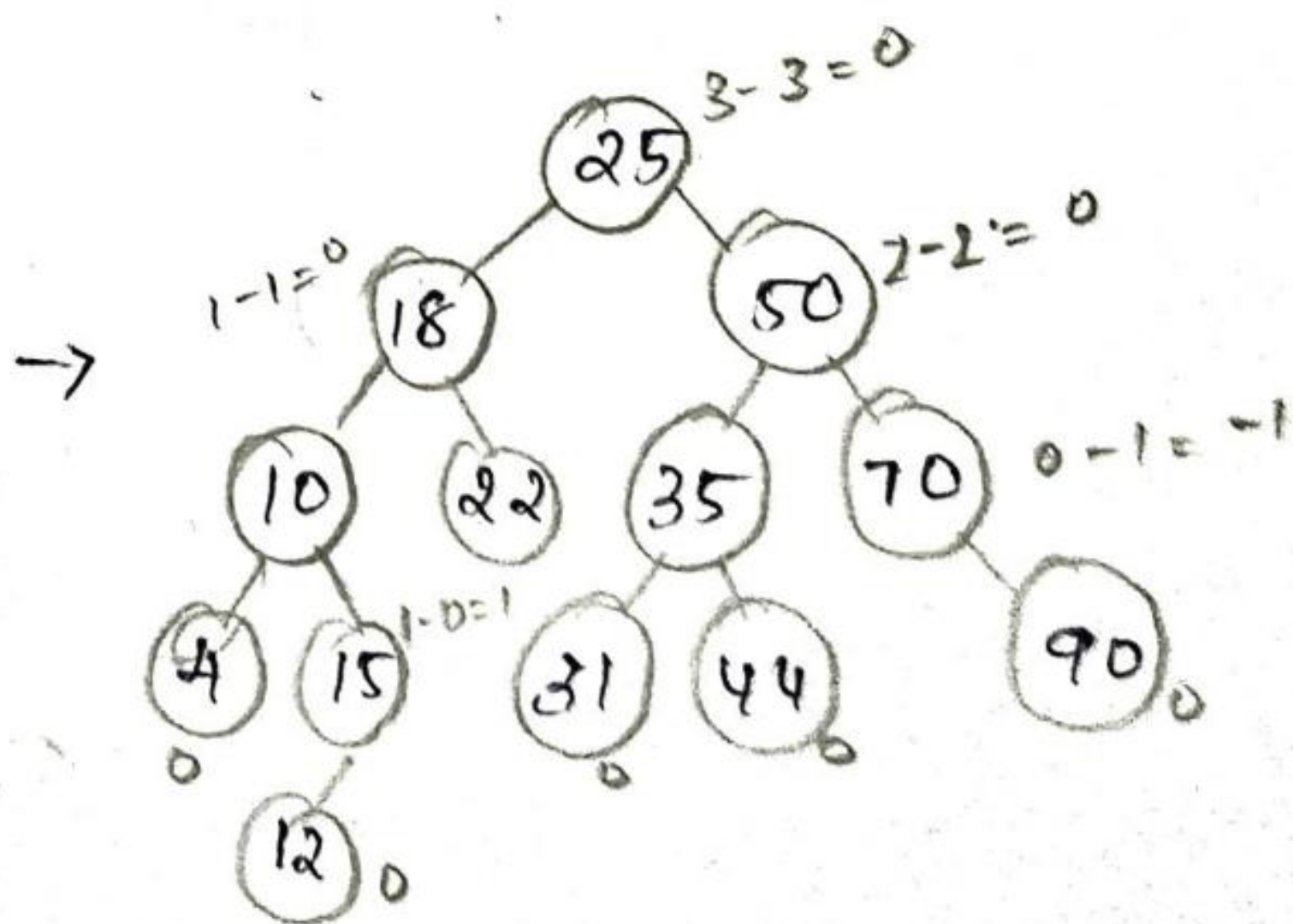
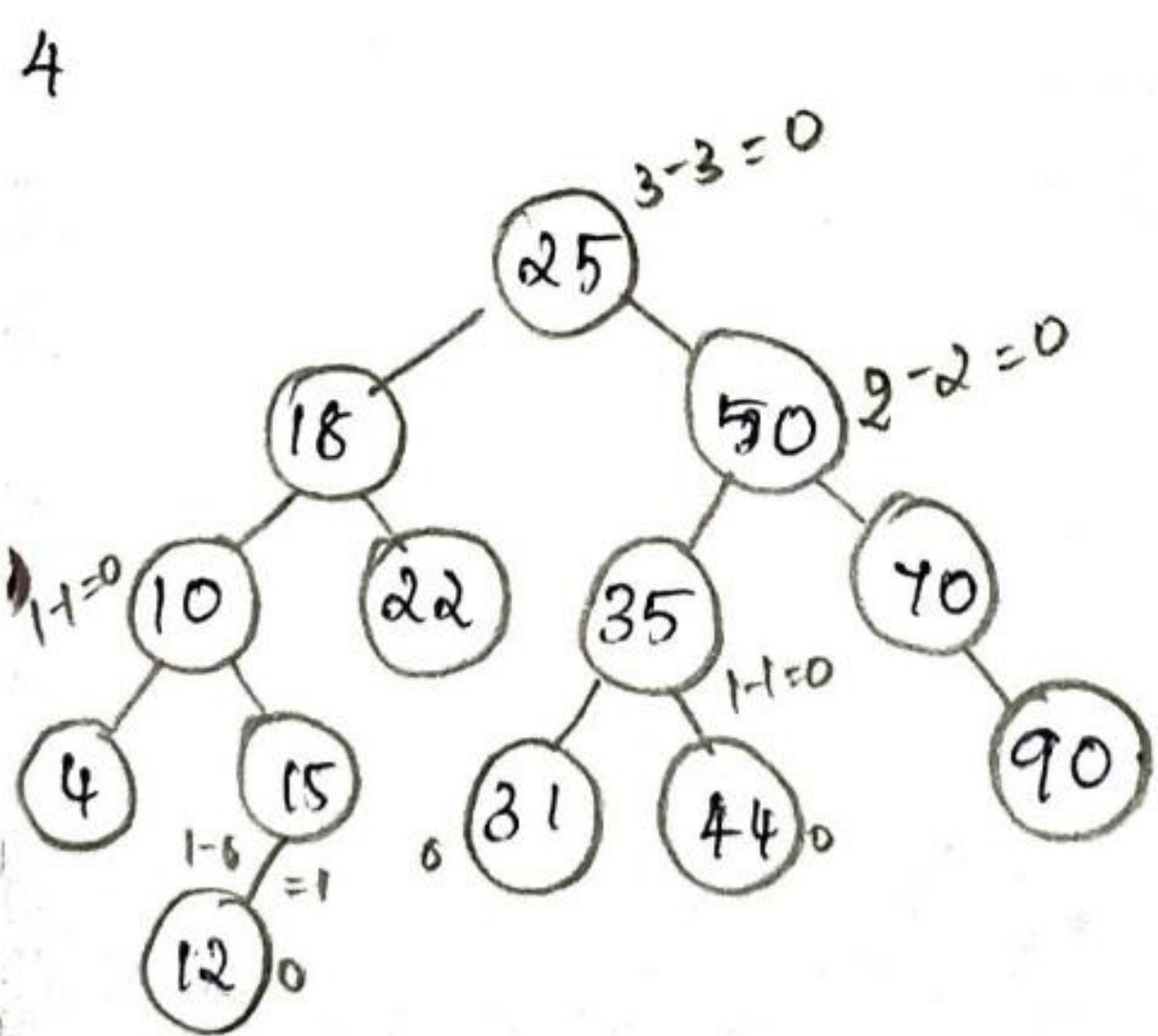
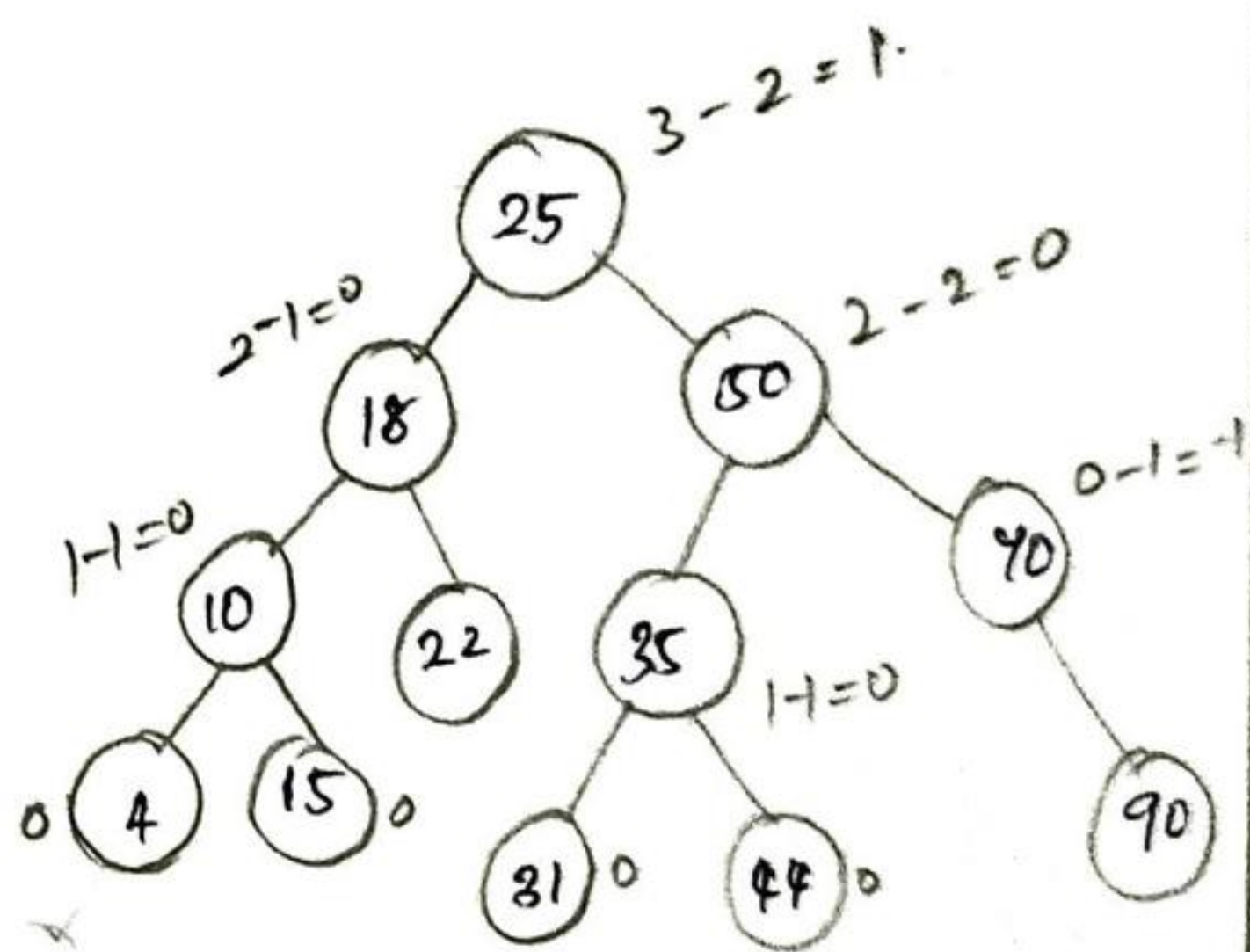
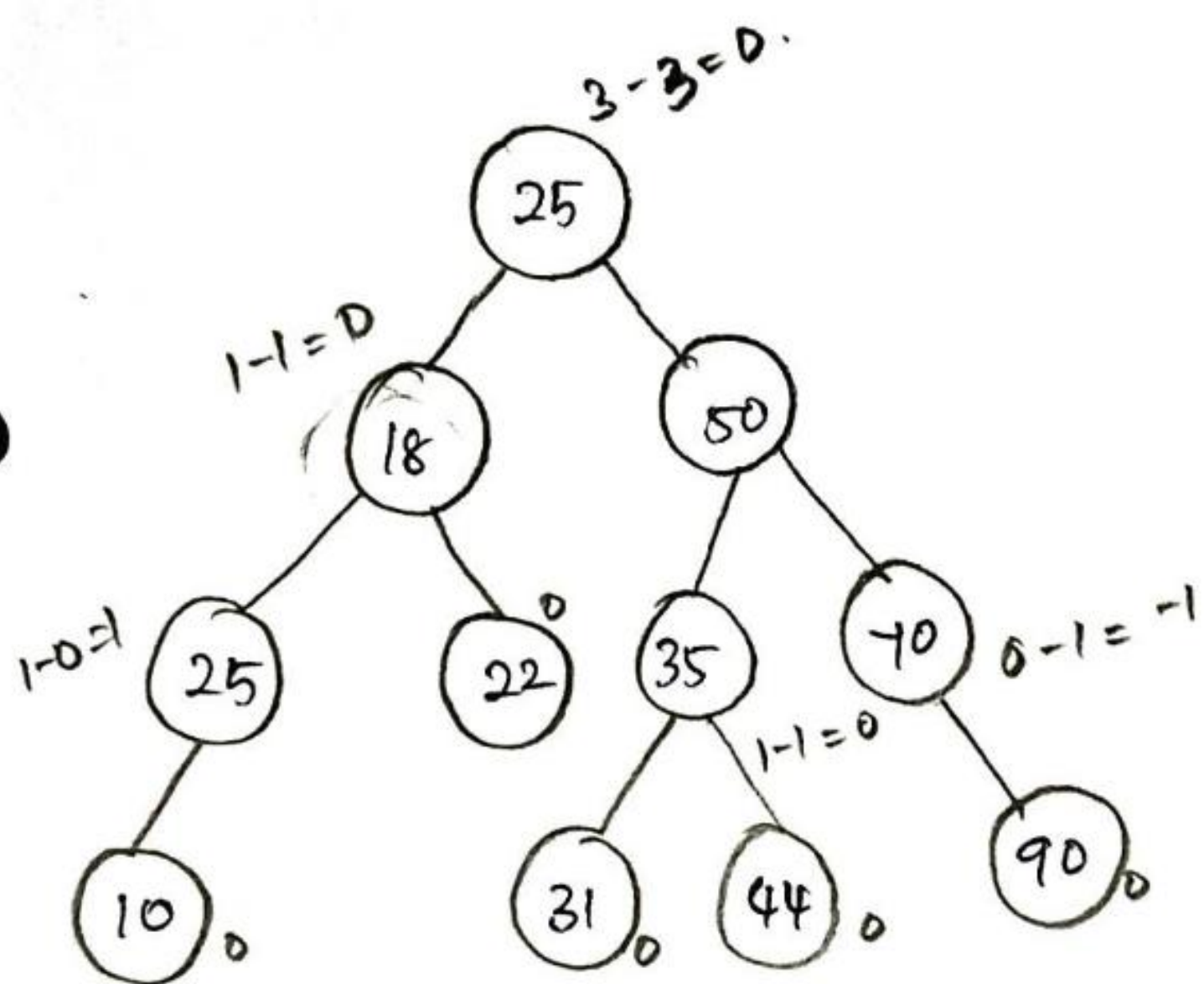
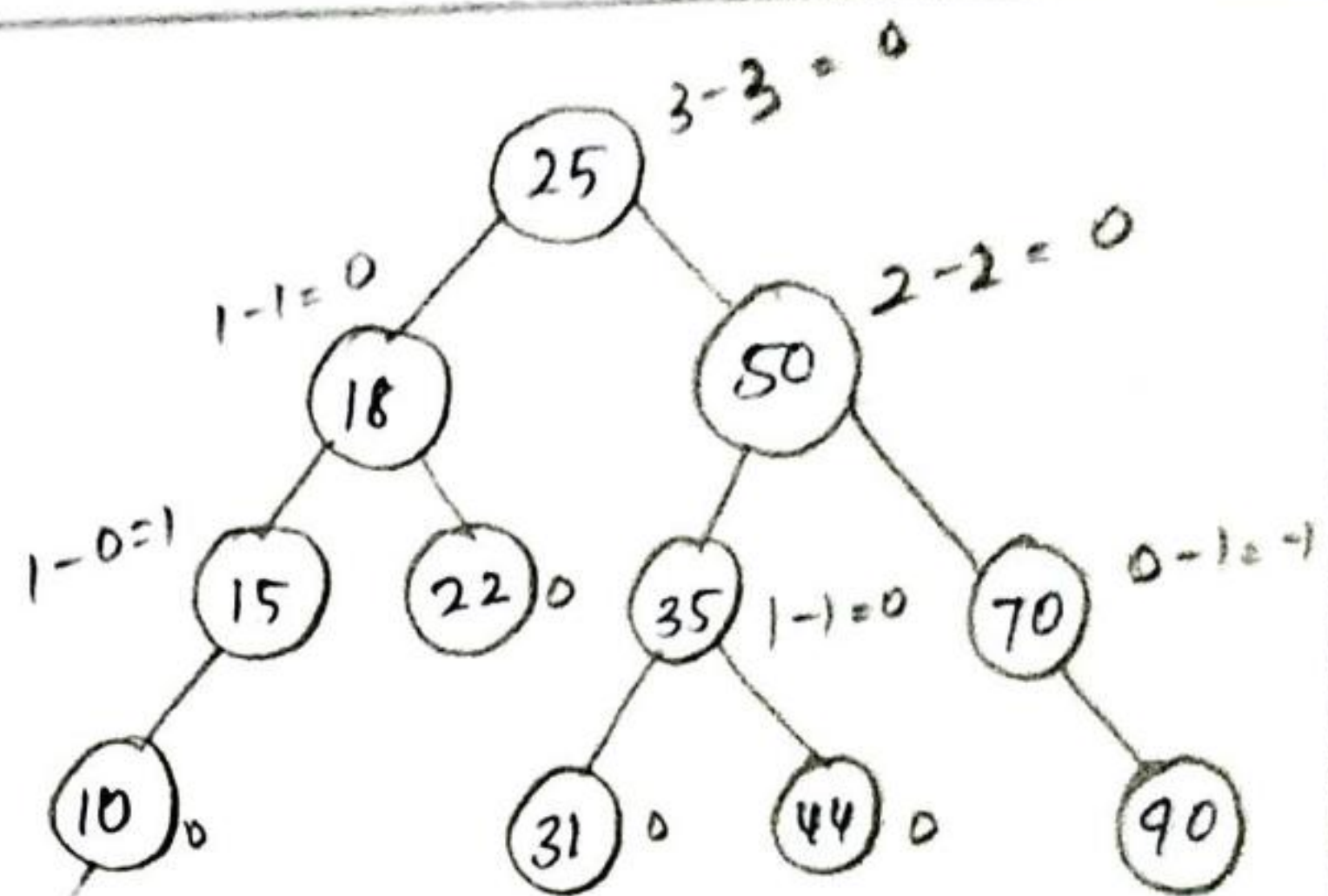
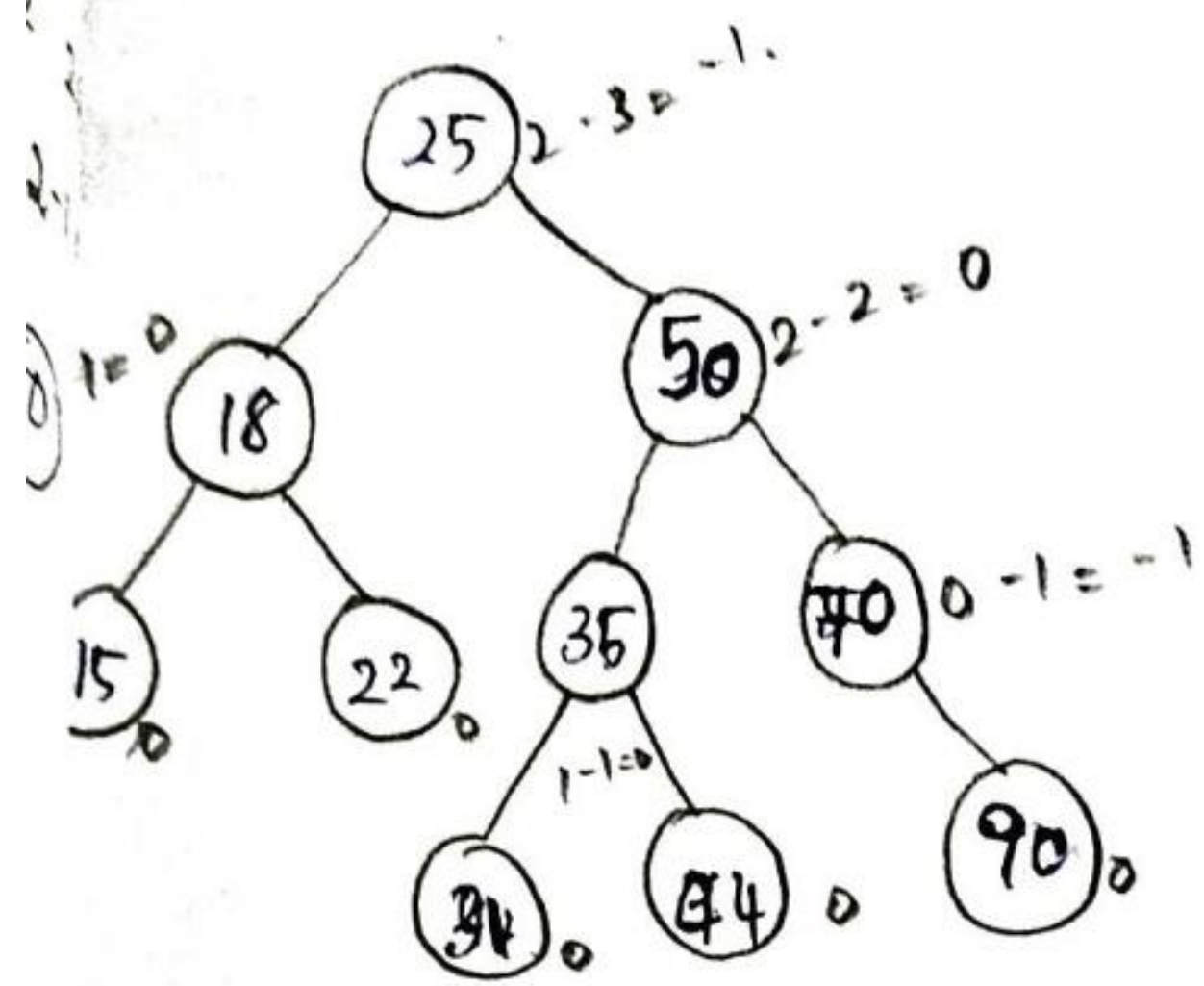
$$\boxed{\quad 8 \quad} \rightarrow \boxed{\quad 2 \quad} \rightarrow \boxed{\quad 3 \quad} \quad 2 \wedge 3 = 8 \rightarrow \boxed{\quad 8 \quad} \quad 8/8 = 1 \rightarrow \boxed{\quad 1 \quad}$$

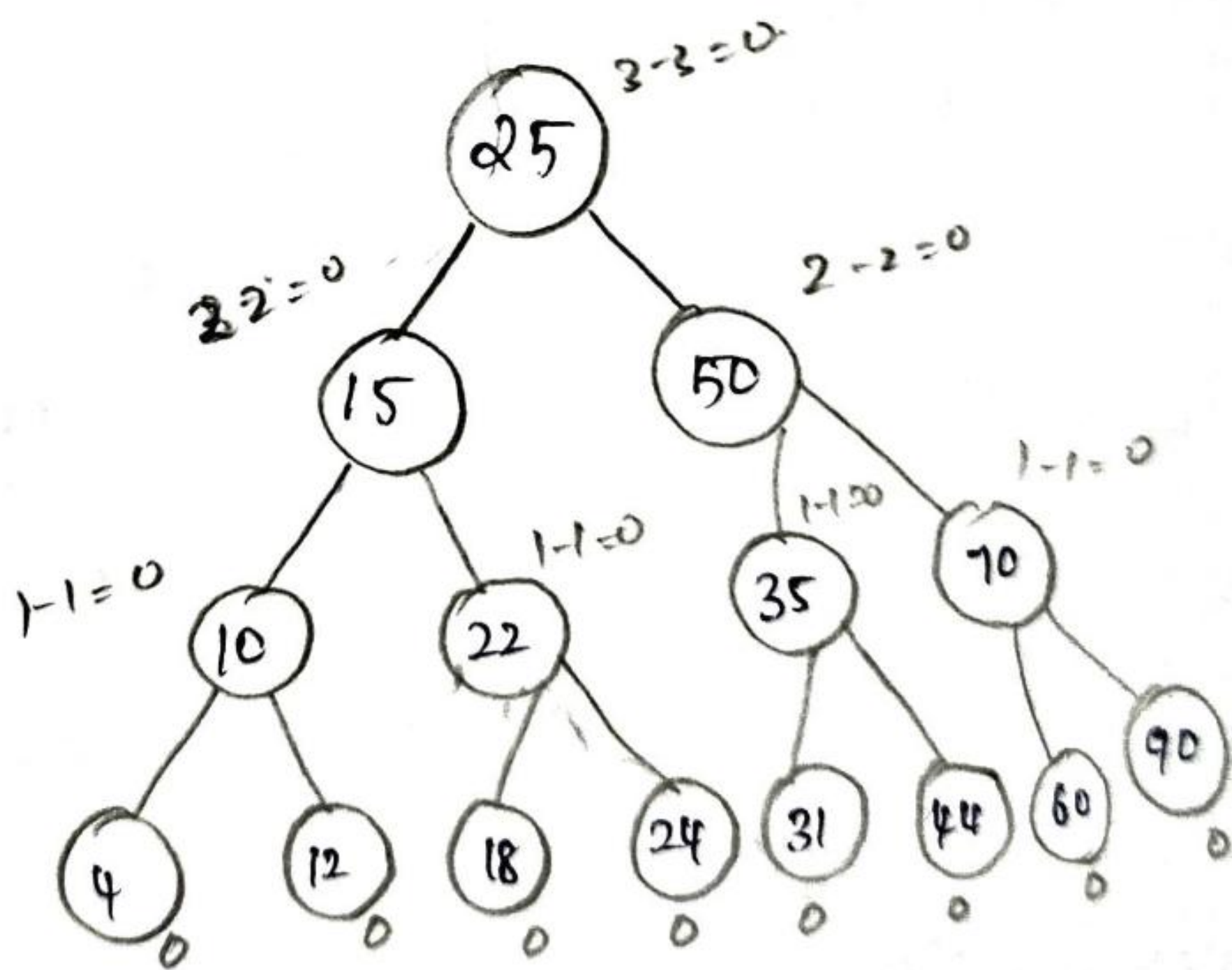
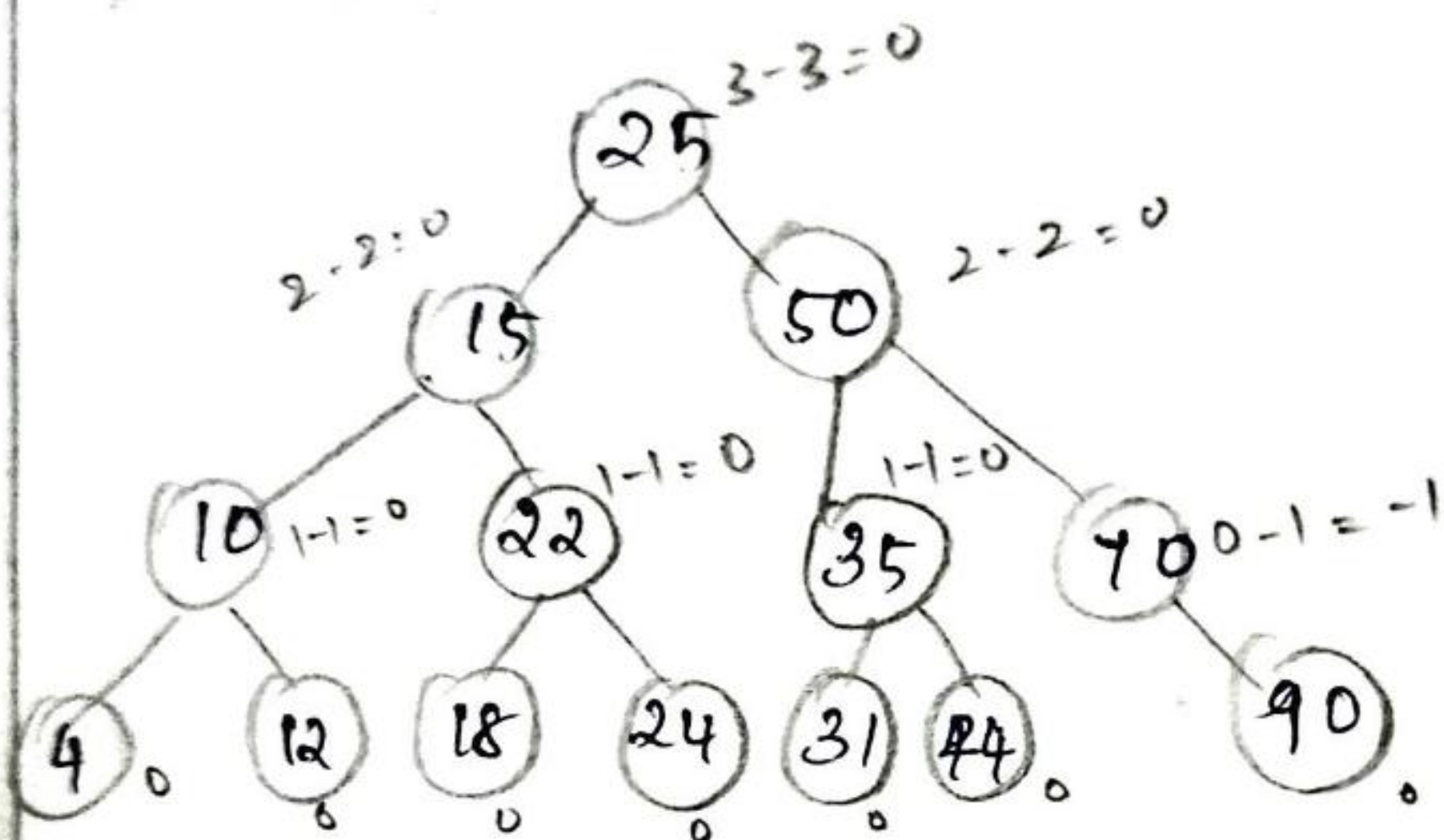
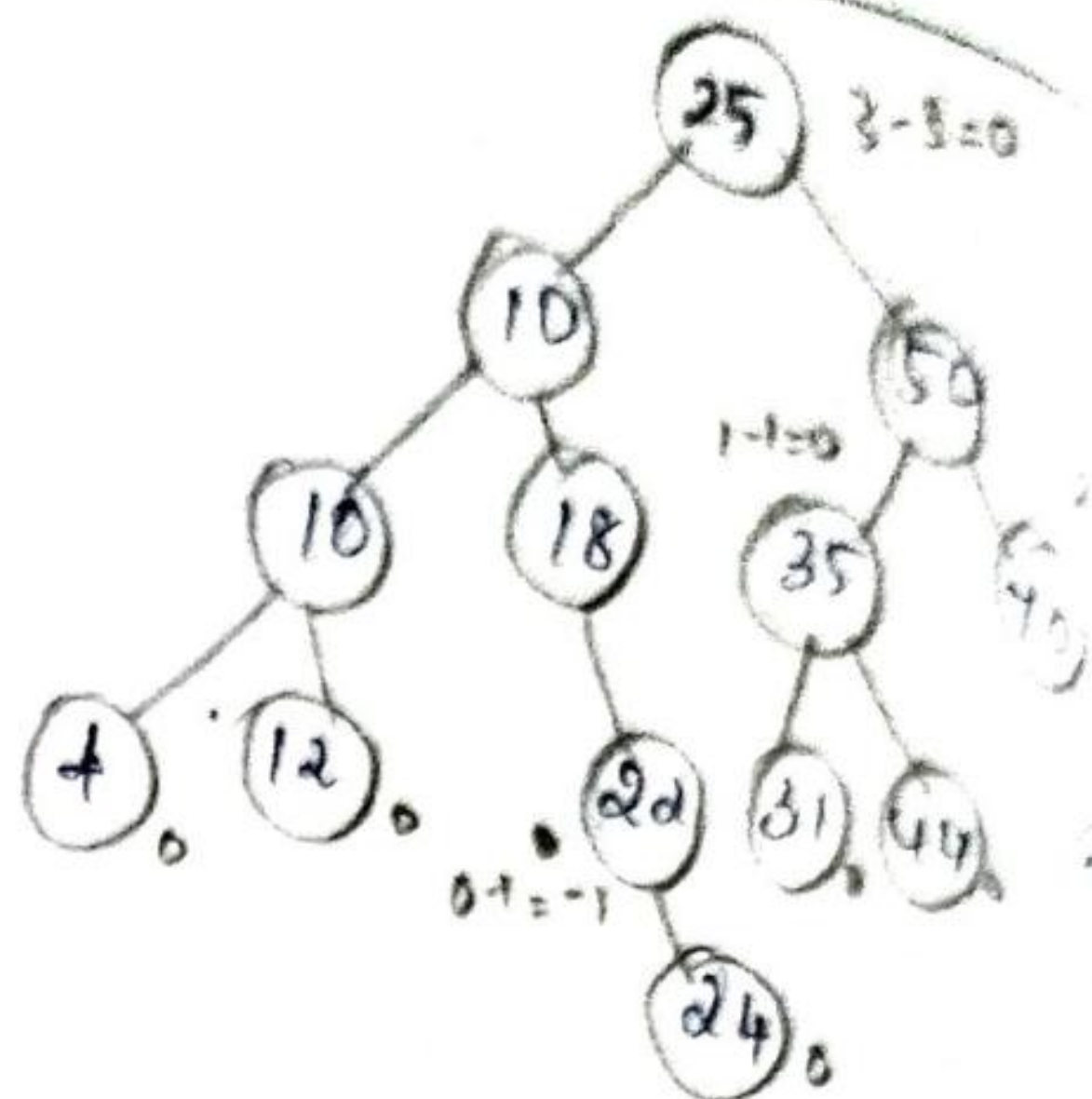
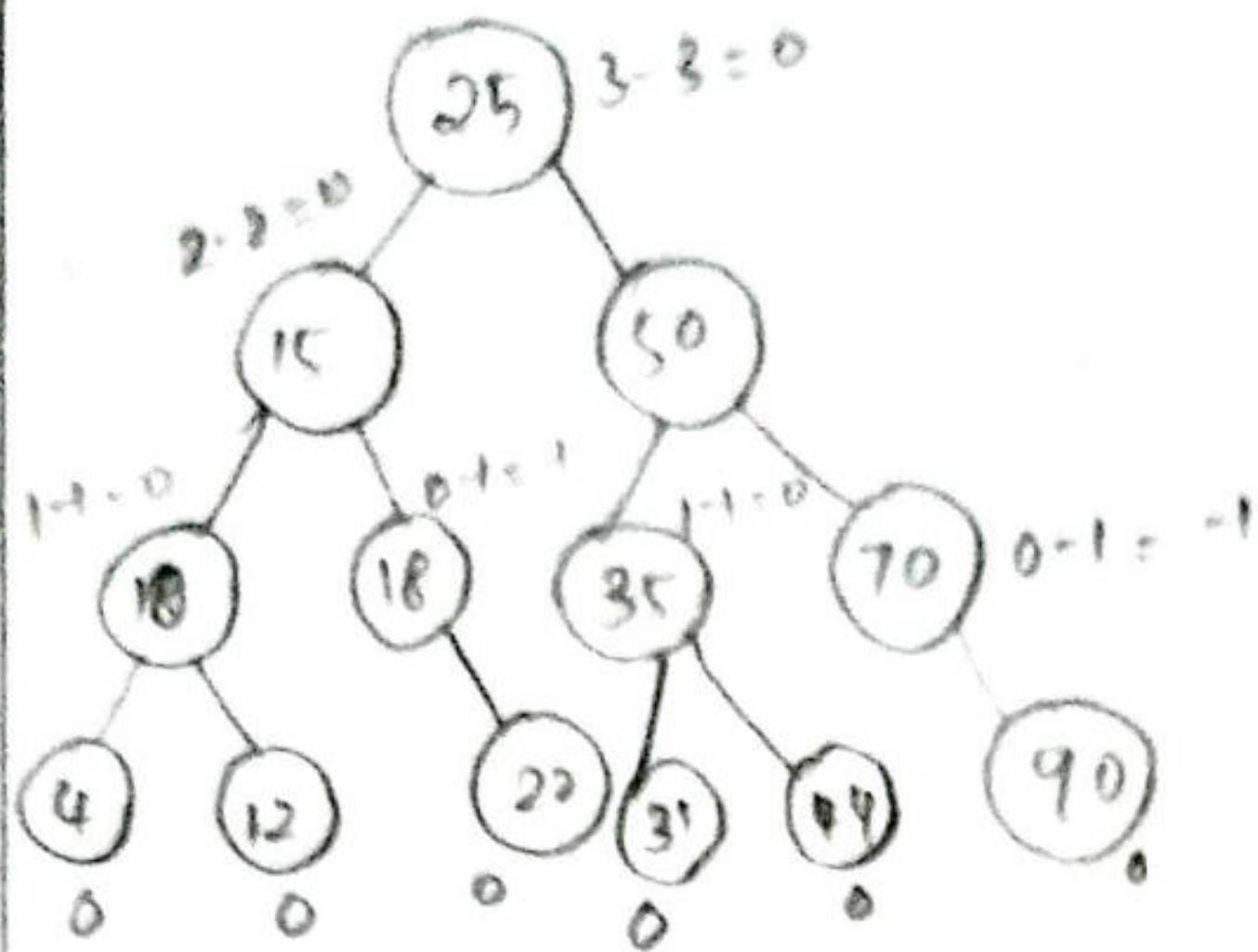
$$\boxed{\quad 4 \quad} \rightarrow \boxed{\quad 5 \quad} \quad 4 * 5 = 20 \rightarrow \boxed{\quad 20 \quad} \quad 1 + 20 \rightarrow \boxed{\quad 21 \quad} \rightarrow \boxed{\quad 8 \quad} \rightarrow \boxed{\quad 3 \quad} \quad 8 * 3 = 24$$

$$\boxed{\quad 24 \quad} \rightarrow 24 - 24 = -3 \quad \boxed{\quad -3 \quad}$$

2. construct a Binary search tree for the following data: 25 50 15 22 18 35 32 44 70 90 40 12







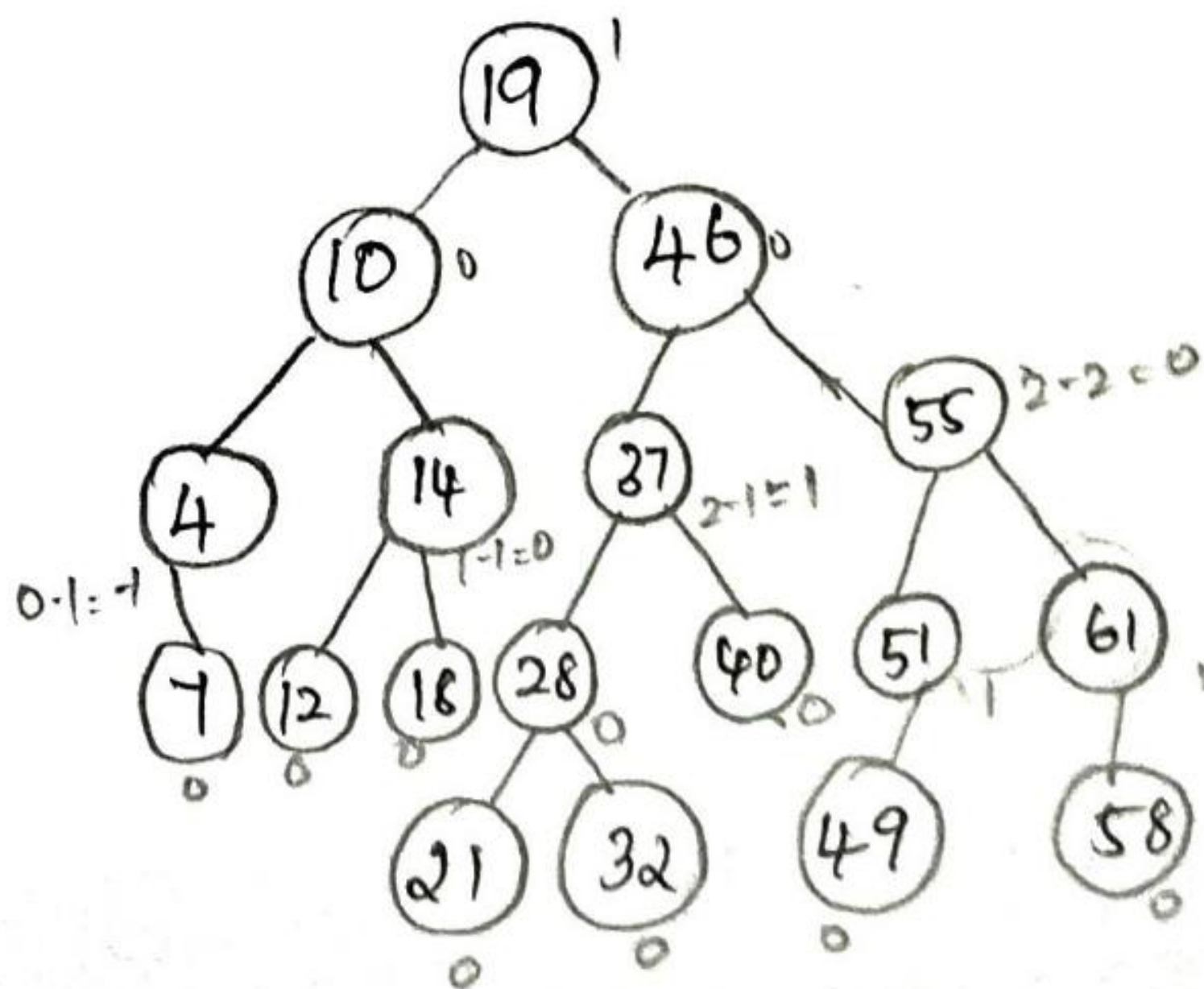
Traverse the above binary search tree using
inorder, preorder, post order the traversal

inorder: 4 10 12 15 18 22 24 25 31 35
44 50 66 70 90

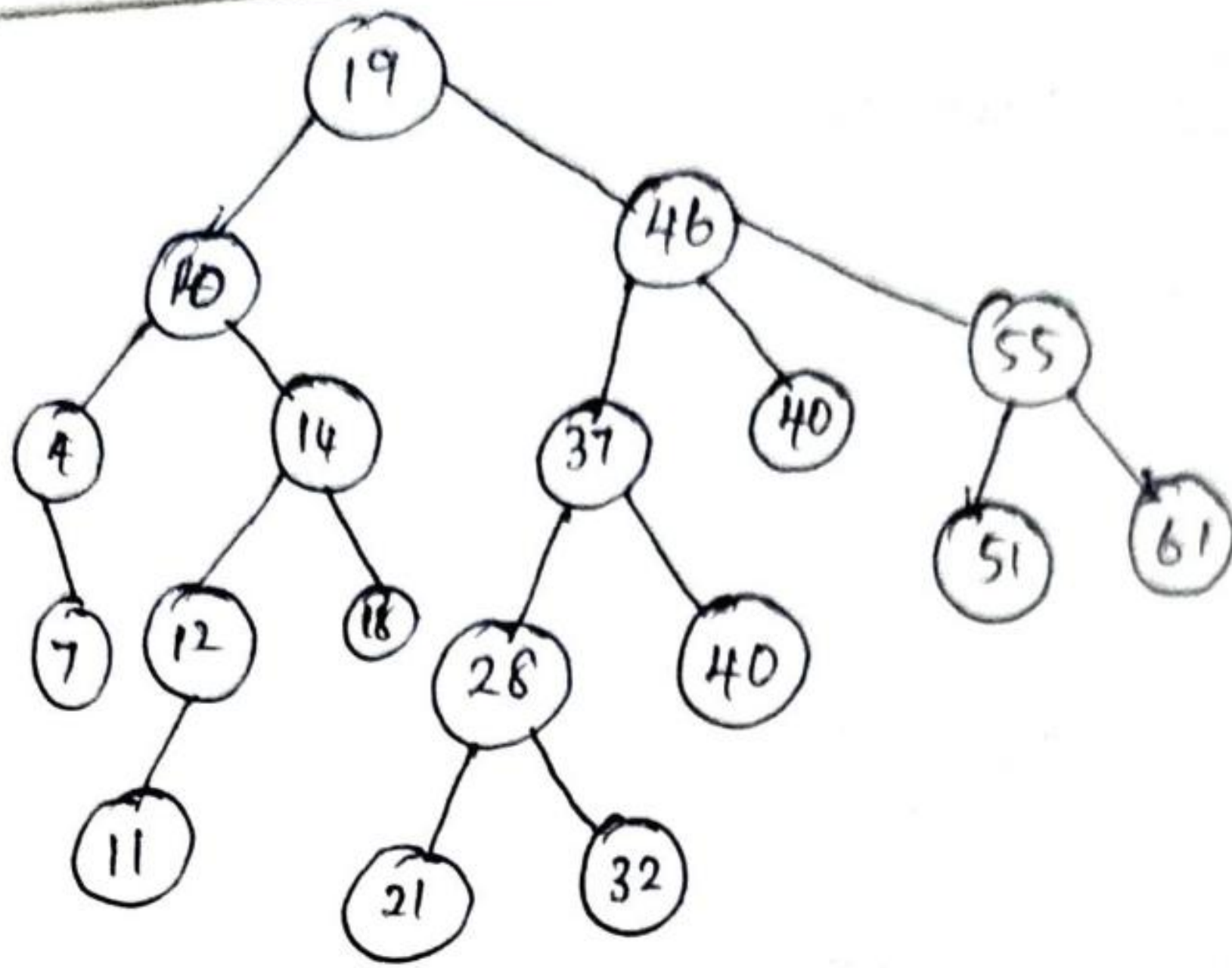
preorder: 25 15 10 4 12 22 18 24 50 35
31 44 70 66 90

postorder: 4 12 10 18 24 22 25 31 44 35
66 90 70 60 25

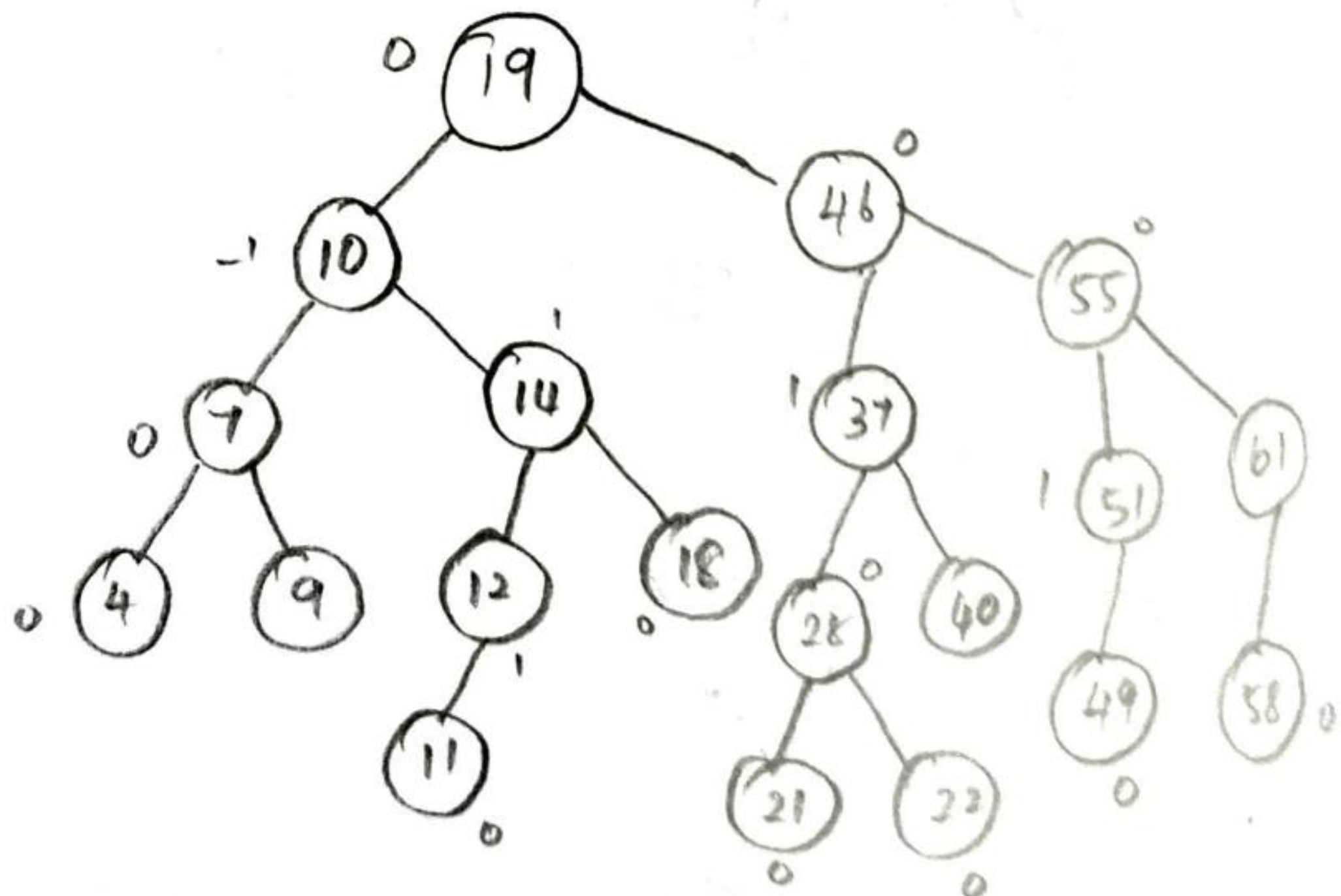
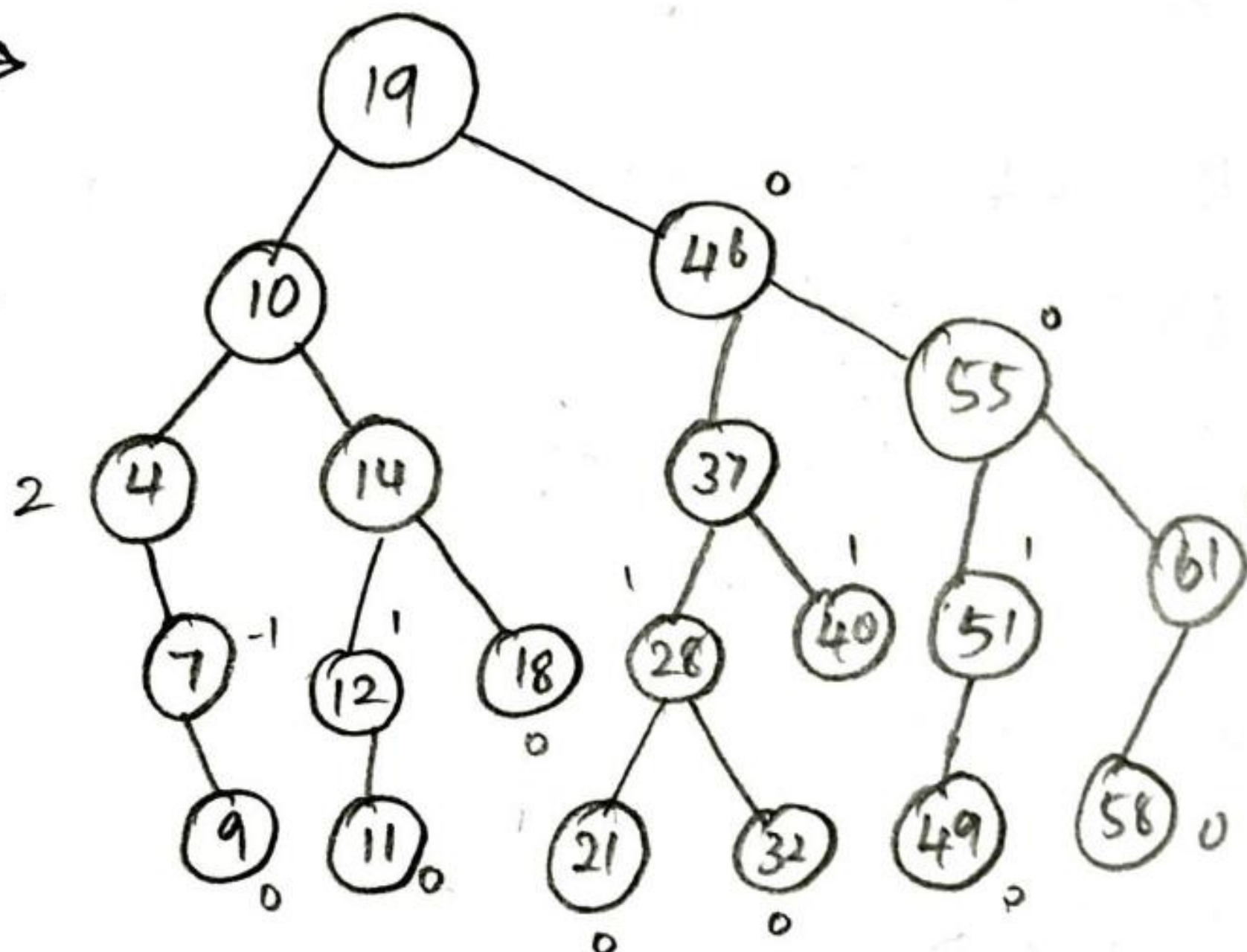
the following AVL tree insert the numbers
9, 6, 56, 20, 25 and delete 18, 58, 19, 28, 32.

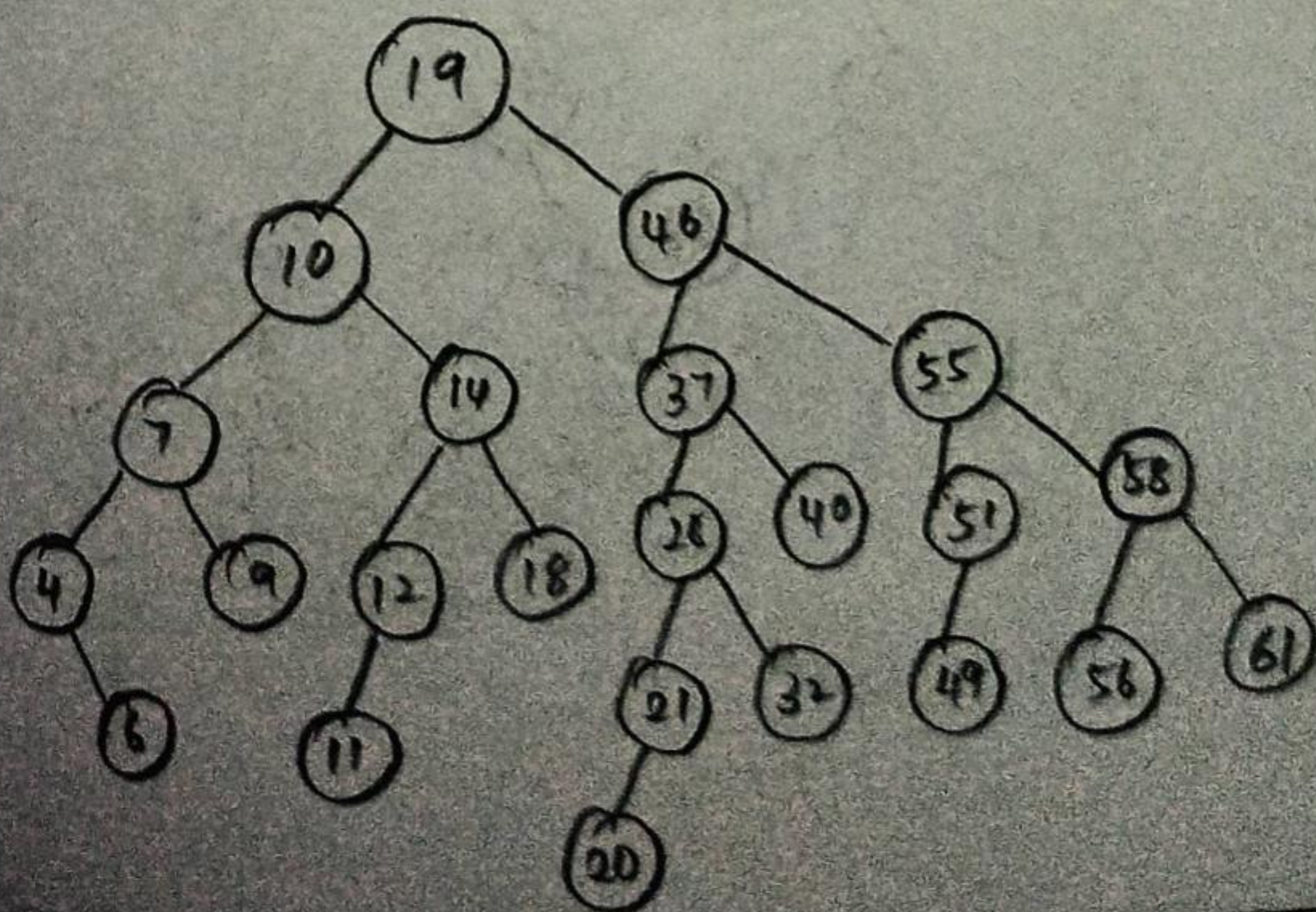
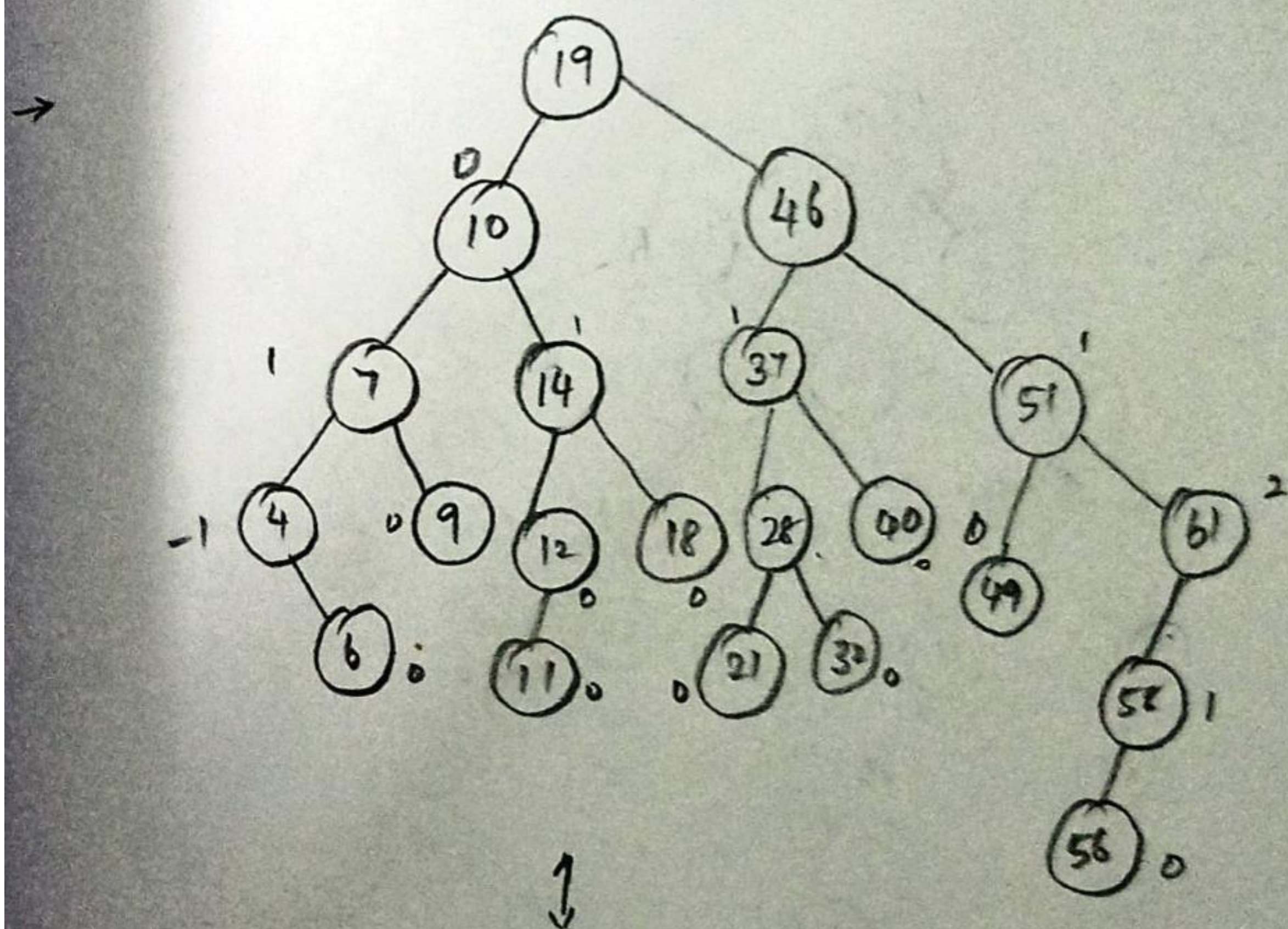
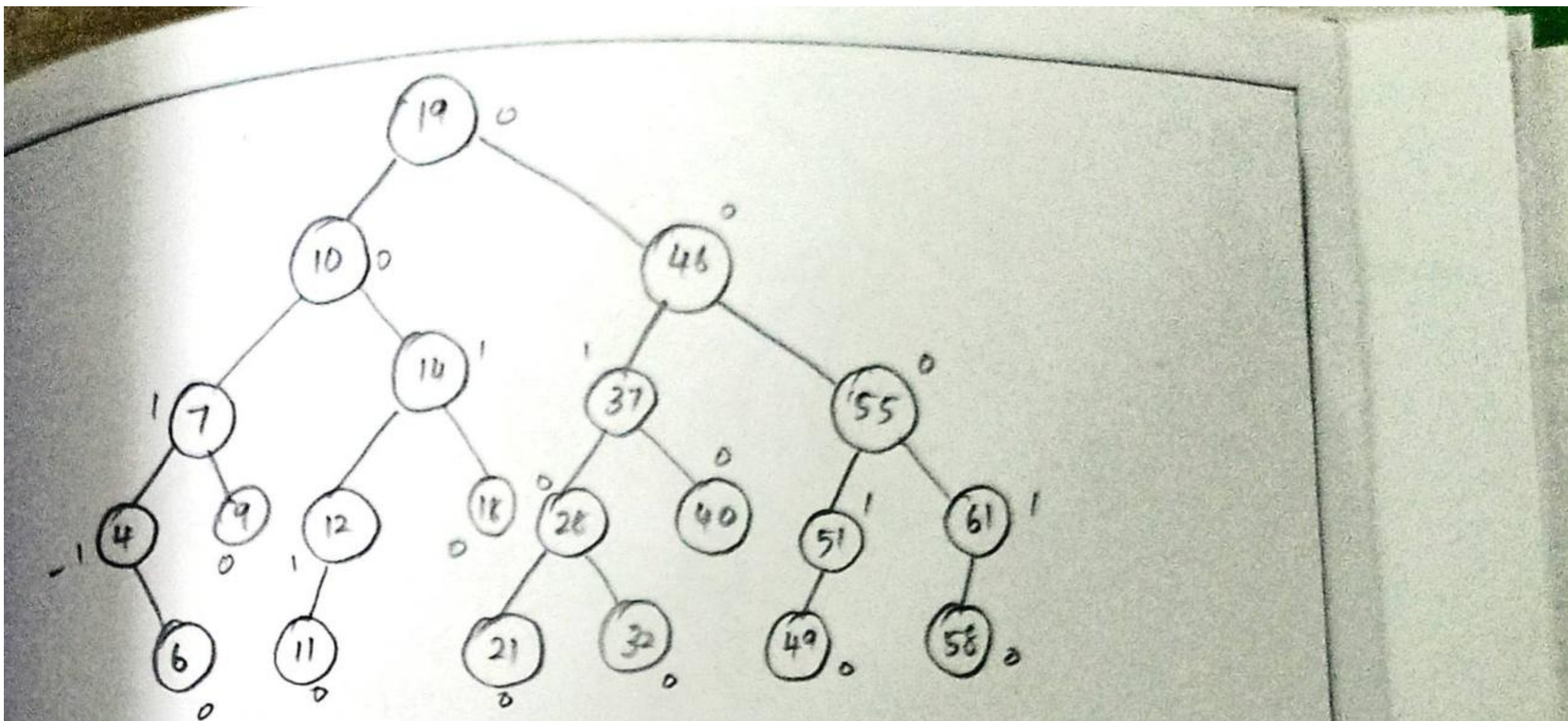


11 →

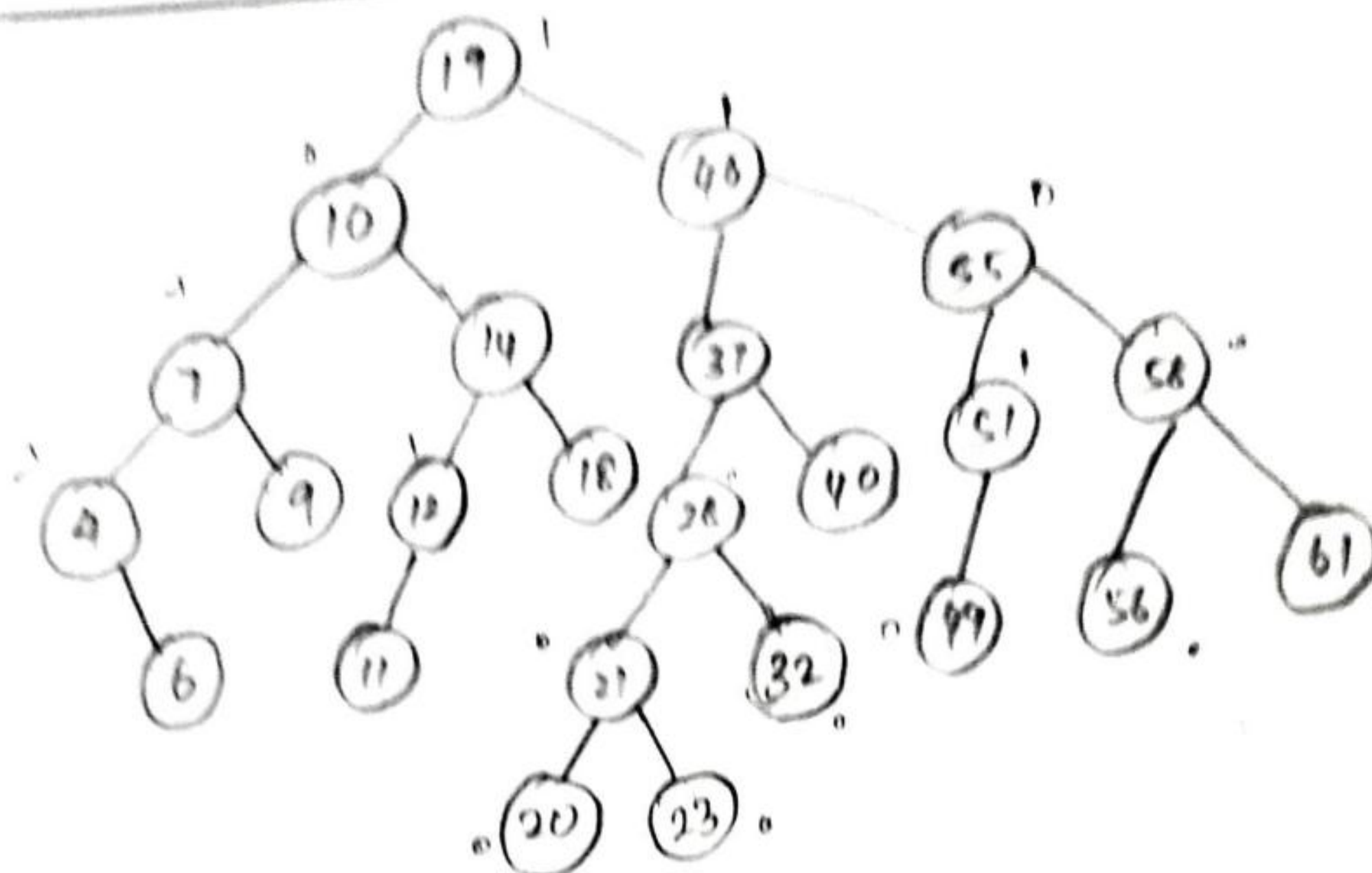


9 →



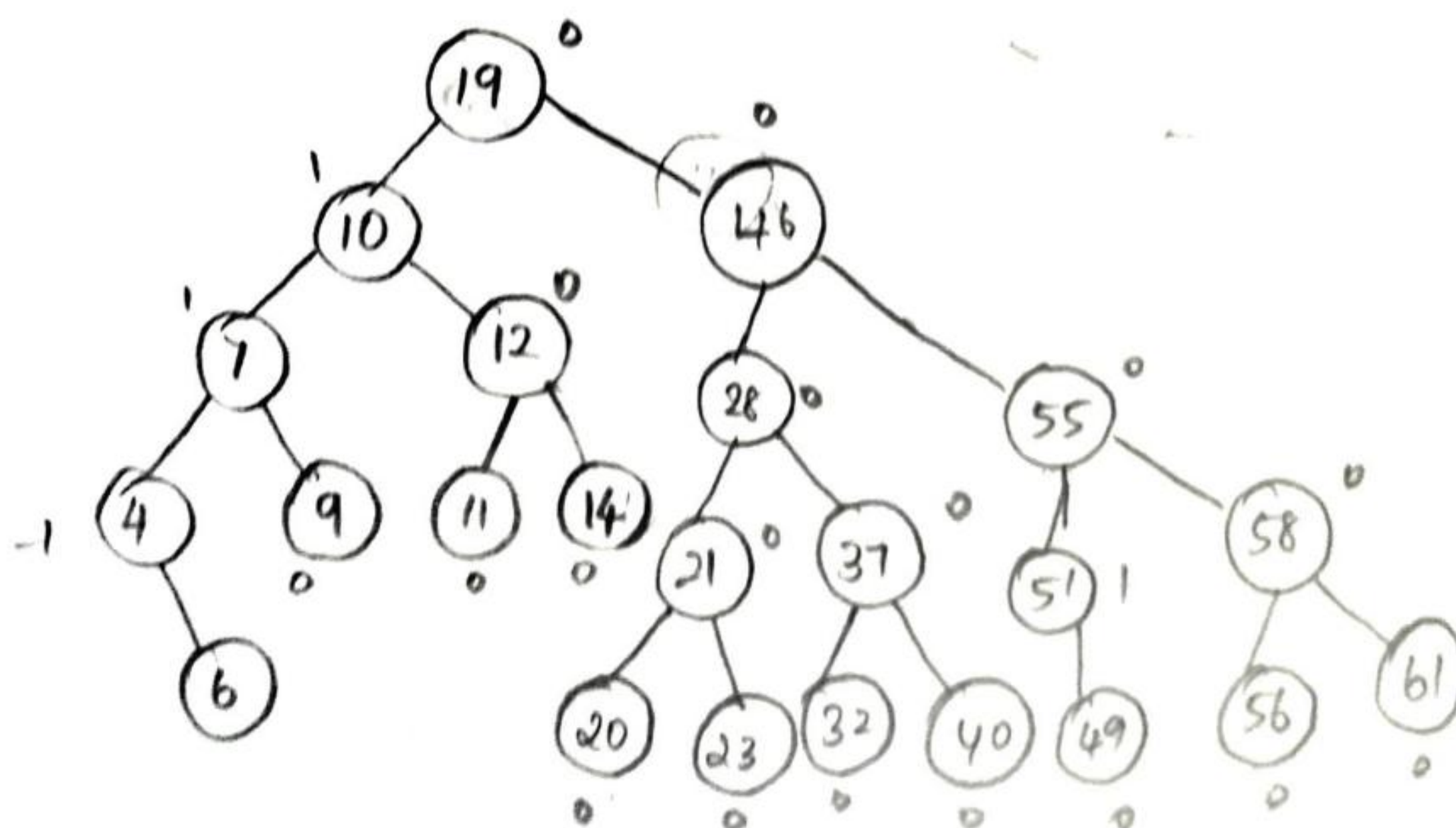
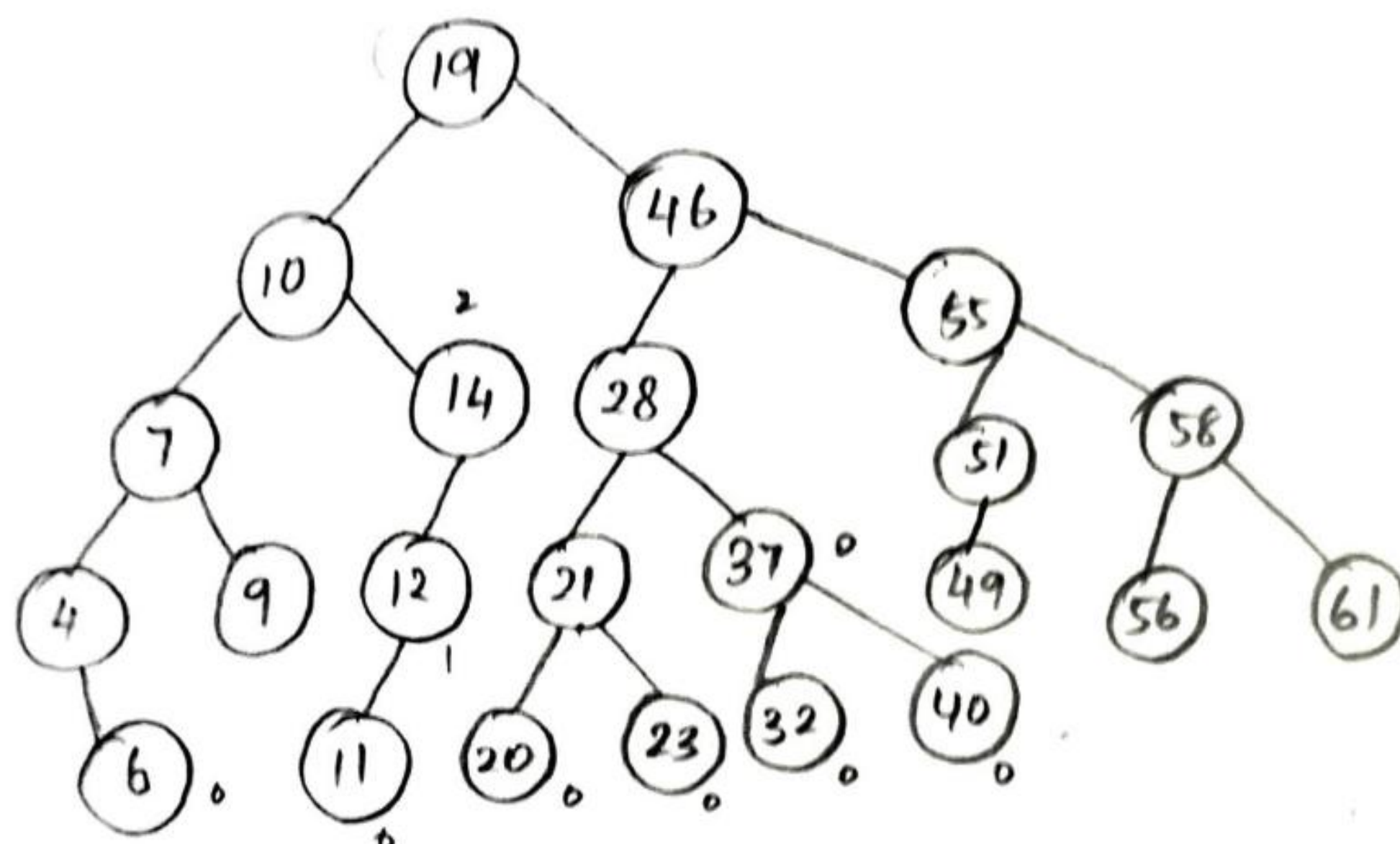


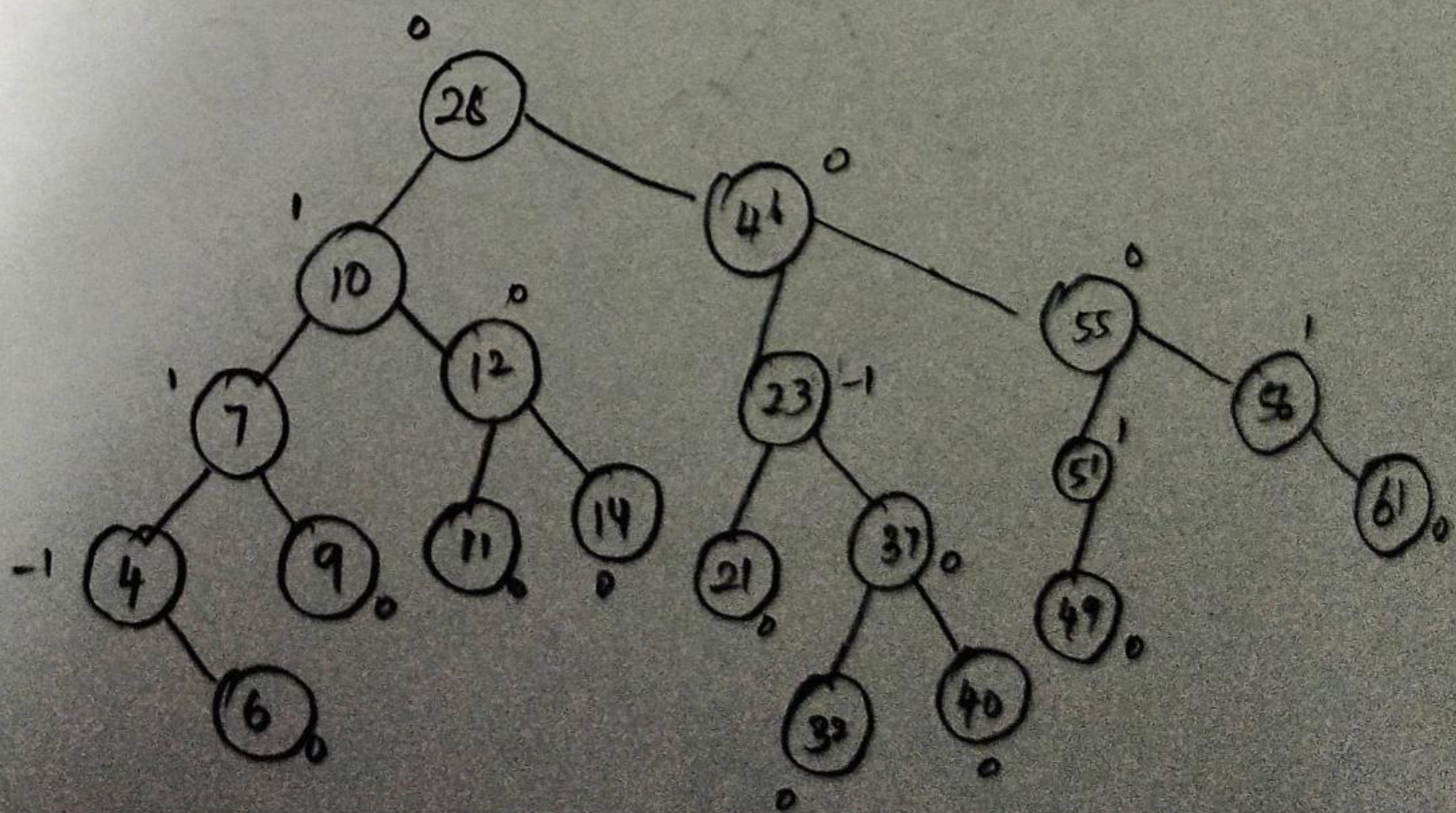
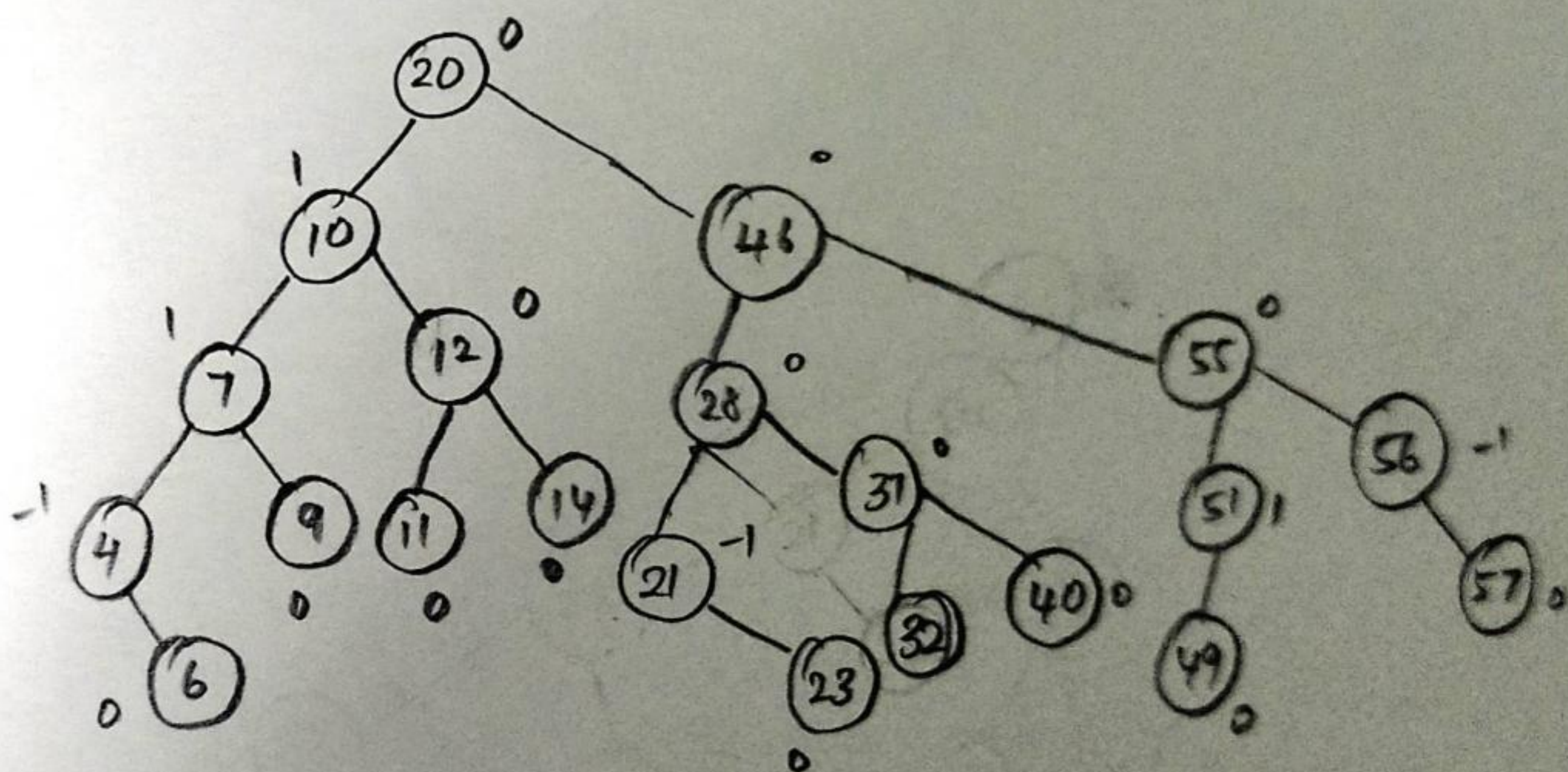
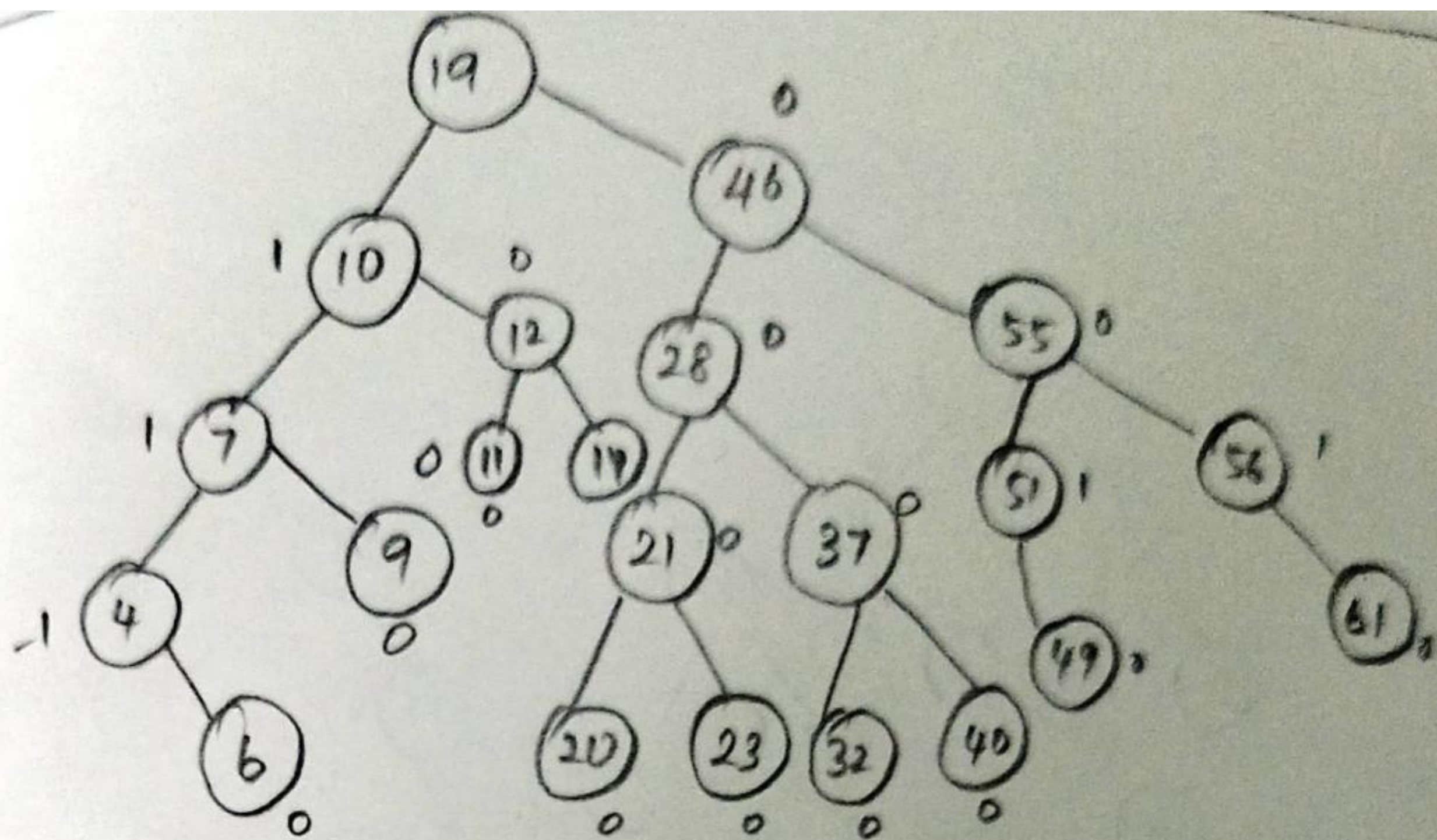
20 →



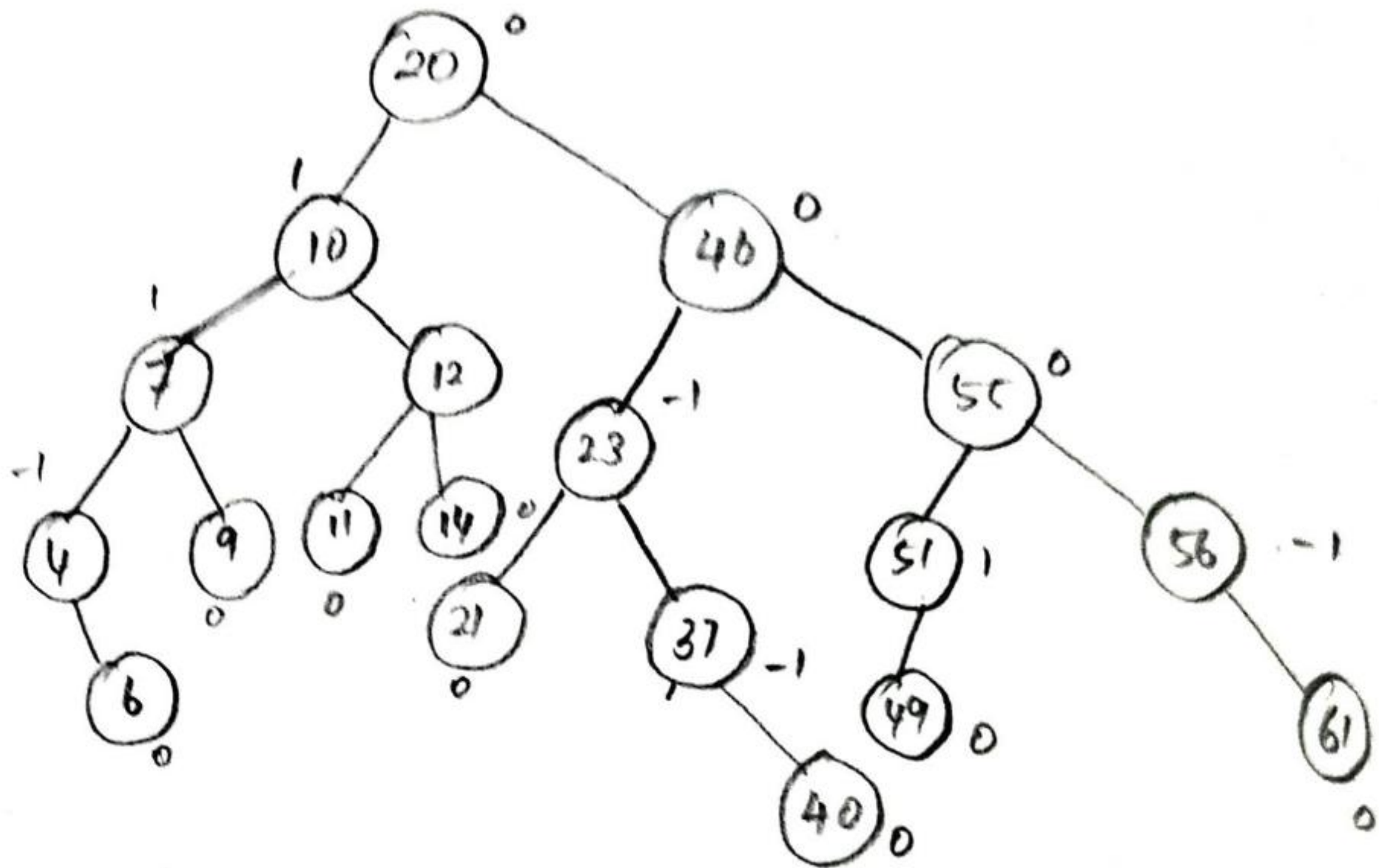
delete:

18 →





32 →



Ans :-

