Karachi Institute of Economics and Technology –North Nazimabad Site		
Course: Data Structures and Algorithms		
Faculty: Akram Hussain	Due Date	02 Jan. 2024
Class ID: 114079	Total Marks:	10
Assignment # 3 (Hard Copy Submission)	Date: 28 Dec., 2023	

Student Name: _____ Student ID: _____

INSTRUCTIONS:

- Attempt all answers in sequence.
- Start each answer on a separate page.
- Plagiarism and late submission will lead to ZERO marks.
- **Submit hard copy.**
- Hand written solution is acceptable, print out is not mandatory.
- Solve your assignment on A4 size paper only. No other type of paper will be accepted.

Q1. Build the binary search tree that is created if the following numbers are inserted in the tree in the given order. [CLO: C3]

12, 15, 3, 35, 21, 42, 14

Q2. Develop inorder and postorder iterative traversal algorithms for BST using stack. Also implement them in Python. [CLO: C3]

Q3. Let a and b denote positive integers. Suppose a function Q is defined recursively as follows:

$$Q(a,b) = \begin{cases} 0 \; if \; a < b \\ Q(a-b,b) + 1 \; if \; b \leq a \end{cases}.$$

a) **Construct** a python program for the recursion. [CLO: C3]

b) **Show** the value of $Q(5861, 7)$. [CLO: C2]