Semester VI **25/05/2025**

Algorithms and Data Structure

Duration : 1h 30 min

Question -1- (5 pts) Respond by True or False:

a- An algorithm is a method for solving a given problem in a finite time.

b- The tree is a linear data structure.

c- Python, C, and Java are not programing languages.

d- A binary tree is a data structure in which each parent node can have at most three children.

e- The Linked List allows non-contiguous allocation of list items.

Question -2- (5 pts)

a. Fill in the table below with appropriate item in the list: trees, simple list, arrays, graphs, stacks, Queues, files, linked list

Linear Data Structure	Non Linear Data Structure

b. Why does the choice of data structure is important in constructing an algorithm (program)?

c. This choice is it independent of programing language?

Question -3- (5pts)

1-The stack of integers {5, 1, 2, 0, 3, 4, 8} is « popped » once.

What is the value returned? Assume the left-most element is the top element of the stack.

2-What does the stack look like after a call to "push" 9?

Question -4-(5 pts)

You are given the tree in the corresponding picture:

a. The root is …….

b. 5 has as children: ……..

c. The leaves are ……

d. The tree has ……as levels.

e. The tree, is it binary?