



PAC INSTITUTE OF TECHNOLOGY AND SOCIAL STUDIES MAY-AUGUST 2025 ASSESSMENT

PRACTICAL ASSESSMENTS

Qualification : Computer Science Level 6

Code : ICT/OS/CS/CR/08/6/A

Unit of Competency : Understand Algorithms and Data Structures

INSTRUCTIONS TO THE CANDIDATE:

- i. In this practical assessment, you are required to write a C++ program that implements THREE data structures (Array, Stack and Linked List) and their operations.
- ii. You have **Ten** minutes to read through the instructions and check availability of resources for the practical.
- iii. The task has specific instructions.
- iv. The task carries **50** marks.
- v. The assessor will record your performance at critical points using audio-visual means

You will be provided with the following resources:

- i. A working computer
- ii. C++ IDE

Task

An array contains the following items {5, 8, 2, 1, 9, 3} using a C++ program, write a program that contains the following features:

- a) Implement a stack using an array. Include the following operations: (15 Marks)
 - i. Push - add an element to the top of the stack
 - ii. Pop - remove the top element from the stack
 - iii. Peek - return the top element without removing it
 - iv. Display - print all the elements in the stack
- b) Sort the array elements using the bubble sort algorithm. (7 Marks)
- c) Perform the binary search on the sorted array elements and return the index of the target element. (8 Marks)
- d) Implement a linked list and perform the following operations: (20 Marks)
 - i. Insertion - add a node at the beginning, end, or a specific position in the list
 - ii. Deletion - remove a node from the list
 - iii. Search - search for a specific element in the list and return its position
 - iv. Display - print all the elements in the list