COMSATS University Islamabad, Attock Campus
Department of Computer Science

Program: SE IV

Fall 2024: Mid Term Examination

Course: - Data Structures and Algorithms

Time Allowed: - 90 Minutes   **Marks: 30**

Name:- _____ **Regn. No:-**_____

Note:- Don't write anything on Question Paper except your Name & Regn. No.

Q1. Demonstrate an understanding of Linear and Non-Linear Data Structures by illustrating real-world examples of each.   (4 Marks)
[CLO1: Employ linear data structures to solve computing problems.]

Q2. Apply the concept of a stack to model the undo functionality in a text editor. Demonstrate how stack operations like push and pop can be used to store and revert changes efficiently.

(6 Marks)

[CLO1: Employ linear data structures to solve computing problems.]

Q3: Apply the algorithm for infix to postfix conversion using a stack to evaluate the below expression. Visually represent the state of the stack after each step of the conversion process.
(10 Marks)

$$A + B \times (C^D - E)^{F + G \times H}$$

[CLO1: Employ linear data structures to solve computing problems.]

Q4: Apply the operations of a doubly linked list to reverse the list of integers below.
10,20,30,40,50

Demonstrate the algorithm steps for reversing the list and explain how each pointer is adjusted during the process.   (10 Marks)
[CLO1: Employ linear data structures to solve computing problems.]