Graphic Era
HILL UNIVERSITY
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GEHU/04M/9.1.3

Mid Term (Even) Semester Examination March 2025

Roll no................................

Name of the Course and semester: Diploma (CS), 4th
Name of the Paper: Data Structures
Paper Code: DTCS404
Time: 1.5 hour   Maximum Marks: 50

Note:
(i)   Answer all the questions by choosing any one of the sub questions
(ii) Each question carries 10 marks.
(iii) Please specify COs against each question.

Q1 (10 marks)
(a) What is data structure? Categorize the different types of data structures and explain deletion operation on array with suitable example.   **CO1**

OR

(b) What is algorithm explain with an example? Illustrate the steps involved in designing of any algorithm.

Q2 (10 marks)
(a) Write a C program to find the largest element stored in an array of integers.   **CO2**

OR

(b) Sort the following sequence of numbers using selection sort technique and show each step clearly:
5,12,15,32,7,8,11,23,3

Q3 (10 marks)
(a) Compute the Big Oh of the following function: **CO1**
   i. $f(n)= 3n-5$
   ii. $f(n)=n^2-n-3$

OR

(b) What is abstract data type? explain in detail with suitable example.

Q4 (10 marks)
(a) Write the Algorithm to search a particular element "item" stored in an array containing n integer elements also write the time complexity of algorithm.   **CO2**

OR

(b) Explain the working of binary search technique by showing each step clearly for the data set 10,20,30,40,50,60,70 in which you want to search the element 50.

Q5 (10 marks)
(a) Write the Algorithm/function for finding all perfect square numbers stored in an array containing n elements.   **CO1**

OR

(b) Sort the following sequence of numbers using bubble sort technique and show each step clearly:
26,67,12,34,2,78,57,43   **CO2**