Graphic Era
HILL UNIVERSITY
Established by an Act of the State Legislature of Uttarakhand (Adhiniyam Sankhya 12 of 2011)
University under section 2(f) of UGC Act, 1956

End Term (Odd) Semester Examination December 2024

Roll no..2492525..........

Name of the Course and semester: BCA (AI & DS) / BCA I SEM
Name of the Paper: Foundation of Computer Programming
Paper Code: TBD102 / TBC102

Time: 3 hour   Maximum Marks: 100

Note:
- *(i)* All the questions are compulsory.
- *(ii)* Answer any two sub questions from a, b and c in each main question.
- *(iii)* Total marks for each question is 20 (twenty).
- *(iv)* Each sub-question carries 10 marks.

Q1.   (2X10=20 Marks)(CO1)

a. What are preprocessor directives in C? Why and When do we use #define, #include directive?

b. Explain the syntax and usage of the ternary operator (? :) in C. Write a program using the ternary operator to:
- Find the largest of three numbers.
- Check whether a given year is a leap year or not.

c. Explain the syntax of the for, while, and do-while loops with examples. Write a program to calculate the sum of the first 10 natural numbers using a loop.

Q2.   (2X10=20 Marks)(CO2)

a. Define a structure named Student with fields for student ID, name, age, and marks in three subjects. Write a program to input data for 5 students, calculate their average marks, and display the details of the student with the highest average marks.

b. With the help of a program explain the concept of Call by value and Call by reference.

c. Explain any five string manipulation library functions in detail with examples.

Q3.   (2X10=20 Marks)(CO3)

a. What are storage classes in C? Discuss the four types with examples.

b. Discuss the differences between `malloc`, `calloc`, `realloc`, and `free` with examples.

c. What are functions and its types? Write a C program to find the entered number is a prime number or not by creating a function.

Q4.   (2X10=20 Marks)(CO4)

a. Write a C program to sort an array of integers using the Bubble Sort algorithm.

b. What do you mean by an array in C language? What are the different types of arrays? Explain with example.

c. Write a program to perform the multiplication of two matrices.

Q5.   (2X10=20 Marks)(CO5)

a. Explain the concept of Recursion by writing a program to find the factorial of a number using recursion.

b. What are command-line arguments in C, and why are they used? Write a program that accepts two numbers as command-line arguments and prints their sum.

c. What is File Handling? What are the various functions used in File handling. Briefly explain.