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.....

Name of the Course and semester: MCA/MCA AI&DS
Name of the Paper: PROGRAMMING AND PROBLEM SOLVING
Paper Code: *TMC 103/TMD 103*
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)
a. Explain the different symbols used in the flow chart. Draw a flow chart to print the sum of the first 50 odd numbers. CO1
b. Write a short note on the ternary operator. Write a c program to print the largest number among three numbers using the ternary operator. CO1
c. What is a variable in C? Write a C program to Swap three variables without using a temporary variable.
Input : a = 10, b = 20 and c = 30
Output : a = 30, b = 10 and c = 20 CO2

Q2. (2X10=20 Marks)
a. Explain conditional branching statements. Write a C Program to input an integer between 1 to 7 and print the day of the week using a switch case.
Input: 2
Output: Tuesday CO2
b. Explain different types of logical operators in C. Write a c program to check if a given year is a leap year or not, using logical operators. CO2
c. Explain the difference between a while and a do-while loop. CO3
Write a Program to Replace all 0's with 1's in a Number.
Input: 102301
Output: 112311

Q3. (2X10=20 Marks)
a. Explain the difference between recursion and iteration. CO4
Write a C program to calculate the power using recursion
Input:
Enter base number: 3
Enter power number: 4
Output:
3^4 = 81
b. Explain the difference between gets() and fgets() string functions. Write a C Program to Count the Number of Vowels, Consonants ,digits and spaces in a lower case string. CO3
input: Enter a string: m s dhoni 07
Output: Vowels: 2
Consonants: 5
Digits: 2
spaces: 3
c. Write a short note on dynamic memory allocation. Explain the malloc() function with an example. CO4

End Term (Odd) Semester Examination December 2024

Q4. (2X10=20 Marks)

a. What are the limitations of array? Write a Program to print the Maximum and Minimum elements in an array.
input: 15, 14, 35, 2, 11, 83
Output: Smallest: 2 and Largest: 83 CO4

b. Define pointers in C. Write a c program to swap two numbers using call by reference. CO4

c. Define a sparse matrix. Write a C program to check if a given matrix is sparse or not. CO4
Input:
1 0 3
0 0 4
6 0 0
Output: YES

Q5. (2X10=20 Marks)

a. What are the advantages of structure over union? Write a C Program to Store information i.e. student name, student roll no, and total percentage, of 10 Students Using an array of Structures. Print the record of the students having a percentage more than 75 percent. CO5

b. What are the different modes of opening a file in C. Explain the difference between fputc() and fputs() with an example. CO5

c. Write a C program to read names and marks of n number of students and store them in a file. CO5