Course Code	**:**	**MCS-011**
Course Title	**:**	**Problem Solving and Programming**
Assignment Number	**:**	**BCA(II)/011/Assignment/2024-25**
Maximum Marks	**:**	**100**
Weightage	**:**	**25%**
Last Dates for Submission	**:**	**31st October, 2024 (For July Session)** **30th April, 2025 (For January Session)**

There are eight questions in this assignment. Each question carries 10 marks. Rest 20 marks are for viva-voce. Answer all the questions. You may use illustrations and diagrams to enhance the explanations. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

Question 1:

Discuss the differences between iterative and recursive approaches in solving problems. Write C programs to compute the factorial of a number using both iterative and recursive methods. Compare their performance and memory usage.

Question 2:

Write a C program to find the sum of all elements in an array.

Question 3:

Write a C program to perform division on 2 matrices A and B of size NXN and store the result in matrix C.

Question 4:

Without using the built-in string functions, write a C program to take a choice from the user (use a SWITCH statement) (i) to find the string length (ii) for string concatenation, (iii) string copy and (iv) string comparison.

Question 5:

Explain the concept of pointers in C and their various uses. Write a C program that uses pointers to perform operations on arrays, including finding the maximum and minimum values, and reversing the array. Discuss the advantages and potential pitfalls of using pointers.

Question 6:

What are structures in C, and how are they used? Write a C program that defines a structure to store student information (name, roll number, and marks) and includes functions to input, display, and sort the student records by marks. Explain the advantages of using structures for complex data.

Question 7:

Explain the concept of file handling in C. Write a C program to read data from a file, process the data (such as calculating the sum and average of numbers), and write the results to another file. Discuss the various modes of file opening and the importance of closing files.

Question 8:

Explain the role of preprocessor directives in C. Write a C program that uses macros to define constants and perform inline calculations. Discuss the use of conditional compilation directives to create a program that behaves differently based on defined macros. Analyze the benefits and limitations of using preprocessor directives in C programming.