

BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-II

ASSIGNMENTS

(July - 2026 & January - 2027)

ECO-02, MCS-011, MCS-012, MCS-015, MCS-013, BCSL-021, BCSL-022,



**SCHOOL OF COMPUTER AND INFORMATION SCIENCES
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
MAIDAN GARHI, NEW DELHI – 110 068**

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Important Notes

1. Submit your assignments to the Coordinator of your Study Centre on or before the due date.
2. Assignment submission before due dates is compulsory to become eligible for appearing in corresponding Term End Examinations. For further details, please refer to BCA Programme Guide.
3. To become eligible for appearing the Term End Practical Examination for the lab courses, it is essential to fulfill the minimum attendance requirements as well as submission of assignments (on or before the due date). For further details, please refer to the BCA Programme Guide.

Course Code	:	MCS-011
Course Title	:	Problem Solving and Programming
Assignment Number	:	BCA(II)/011/Assignment/2026-27
Maximum Marks	:	100
Weightage	:	25%
Last Dates for Submission	:	31st October, 2026 (For July 2026 Session)
	:	30th April, 2027 (For January 2027 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.

Q1: (10 Marks)

Explain the concepts of *recursion* and *iteration* in C with suitable examples. Write two separate C programs to calculate the *Greatest Common Divisor (GCD)* of two positive integers:

- using an iterative approach and
- using a recursive approach

Compare both approaches.

Q2: (10 Marks)

Write a C program that accepts n integer values from the user and performs the following operations using one-dimensional arrays:

- Find the second largest and second smallest elements.
- Count the number of even and odd numbers.
- Display all duplicate elements, if any.
- Compute the average of all elements.

Q3: (10 Marks)

Write a C program to perform operations on a square matrix of order N .

The program should:

- Find the sum of each row and each column.
- Compute the sum of the principal and secondary diagonals.
- Check whether the matrix is symmetric.
- Display the transpose of the matrix.

Q4:

(10 Marks)

Without using any built-in string handling functions, write a menu-driven C program to perform the following operations on a given string:

1. Reverse the string.
2. Count the number of words.
3. Convert the string to uppercase.
4. Check whether the string is an anagram of another string.
5. Display the frequency of vowels and consonants.

Use the *switch-case* construct for implementing the menu.

Q5:

(10 Marks)

Explain the concept of *dynamic memory allocation in C*. Write a C program that dynamically allocates memory to store the details of *N products* (Product ID, Product Name, Quantity, Price).

The program should:

- Accept product details.
- Display all products.
- Find the costliest product.
- Calculate the total inventory value.
- Release the allocated memory before termination.

Discuss the advantages of dynamic memory allocation in this context.

Q6:

(10 Marks)

Explain the role of *structures* and *nested structures* in C programming. Define appropriate structures for a *Library Management System* containing:

- Book ID
- Title
- Author
- Publisher
- Number of Copies

Write functions to:

- Input book details.
- Display all records.
- Search a book using Book ID.
- Display books written by a specified author.

- Find the book having the maximum number of available copies.

Q7:

(10 Marks)

Write a C program to maintain *electricity consumer records* using file handling.

The program should:

- Read consumer details from a file.
- Calculate the electricity bill based on units consumed.
- Determine whether the consumer is eligible for a subsidy (based on user-defined criteria).
- Store the generated bills in another file.
- Display all processed records.

Explain the file handling operations used in the program.

Q8:

(10 Marks)

Write a C program that:

- Uses macros to calculate the area and perimeter of a rectangle and a circle.
- Uses conditional compilation (`#ifdef`, `#ifndef`, or `#if`) to selectively compile either the rectangle calculations or the circle calculations.
- Demonstrates the use of a user-defined header file containing the required macros.

Discuss the advantages of using header files and preprocessor directives in modular programming.