

BACHELOR OF COMPUTER APPLICATIONS (BCA)

(Revised Syllabus)

BCA(Revised Syllabus)/ASSIGN/SEMESTER-IV

ASSIGNMENTS

(July – 2026 & January - 2027)

**(BCS-040, MCS-024, BCS-041, BCS-042,
MCSL-016, BCSL-043, BCSL-044, BCSL-045)**



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

CONTENTS

Course Code	Assignment No.	Submission-Schedule		Page No.
		For July- December Session	For January- June Session	
BCS-040	BCA(IV)/040/Assignment/26-27	31 st October, 2026	30 th April, 2027	3
MCS-024	BCA(IV)/024/Assignment/26-27	31 st October, 2026	30 th April, 2027	6
BCS-041	BCA(IV)/041/Assignment/26-27	31 st October, 2026	30 th April, 2027	7
BCS-042	BCA(IV)/042/Assignment/26-27	31 st October, 2026	30 th April, 2027	10
MCSL-016	BCA(IV)/L-016/Assignment/26-27	31 st October, 2026	30 th April, 2027	12
BCSL-043	BCA(IV)/L-043/Assignment/26-27	31 st October, 2026	30 th April, 2027	14
BCSL-044	BCA(IV)/L-044/Assignment/26-27	31 st October, 2026	30 th April, 2027	15
BCSL-045	BCA(IV)/L-045/Assignment/26-27	31 st October, 2026	30 th April, 2027	18

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	:	BCSL-045
Course Title	:	Introduction to Algorithm design Lab
Assignment Number	:	BCA(IV)/L-045/Assignment/2026-27
Maximum Marks	:	50
Weightage	:	25%
Last date of Submission	:	31st October, 2026 (For July 2026 Session)
	:	30th April, 2027 (For January 2027 Session)

Note: Answer all the questions which carry 40 marks. All questions are of equal marks. The rest 10 marks are for viva voce. You are required to write programs in C-language for all the problems, execute and show the results. 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. Make suitable assumption if necessary.

Q1: Implement *Insertion Sort* and *Selection Sort* in C for randomly generated integer arrays of sizes 10 and 15. Perform the following:

- Count the number of comparisons and swaps.
- Measure the execution time for both algorithms.
- Present the observations in a tabular form.
- Compare their best-case and worst-case time complexities.

(8 Marks)

Q2: Write a C program to solve the *Tower of Hanoi* problem using recursion. Your program should:

- Accept the number of disks from the user.
- Display all the moves required.
- Calculate the total number of moves.
- Verify that the number of moves satisfies the formula $2^n - 1$.
- Discuss the time complexity of the recursive solution.

(8 Marks)

Q3: Implement Dijkstra's algorithm for a graph with 5 nodes using adjacency list representation. Display the shortest path tree and explain how the greedy choice is applied at each step. **(8 Marks)**

Q4: Write a C program to perform and visualize DFS and BFS traversal of a user-defined undirected graph. Record and report the order of traversal and number of operations. **(8 Marks)**

Q5: Develop a C program to implement *Linear Search* and *Binary Search*.

For an array of user-defined integers:

- Search for a given element using both algorithms.
- Display the number of comparisons made.
- Compare their performance for sorted and unsorted data.
- Explain why Binary Search is more efficient under appropriate conditions.

(8 Marks)