BACHELOR OF COMPUTER APPLICATIONS (BCAOL)

(Revised Syllabus)

ASSIGNMENTS

(July – 2025 & January – 2026 sessions)

(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**

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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	:	**BCSL-045**
Course Title	:	**Introduction to Algorithm design Lab**
Assignment Number	:	**BCA(IV)/L-045/Assignment/2025-26**
Maximum Marks	:	**50**
Weightage	:	**25%**
Last date of Submission	:	**31st October, 2025 (For July Session)**
	:	**30th April, 2026 (For January 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 and compare time complexity of Merge Sort and Quick Sort for randomly generated arrays of sizes 10 and 50. Display loop counts and timing results to determine efficiency in practice.

(8 Marks)

Q2. Write a C program to simulate the recursive and iterative versions of the Fibonacci sequence generation. Analyze and compare their time and space complexities. **(8 Marks)**

Q3. Develop a C program to calculate power a^n using both Binary Exponentiation and the Naive method. Compare the number of multiplications in both methods for different values of n.

(8 Marks)

Q4. 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)

Q5. 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)**