

MASTER OF SCIENCE ARTIFICIAL INTELLIGENCE & MACHINE LEARNING (MSCAIML)

MSCAIML/ASSIGN/SEMESTER-I

ASSIGNMENTS

(July – 2026)

**MCS-061, MCS-081, MCS-208, MCS-082, MCSL-209,
MCSL-083**



**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 MSCAIML Programme Guide.
3. To become eligible for appearing in the Term End Practical Examination for the labcourses, 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 MSCAIML Programme Guide.
4. The viva voce is compulsory for the assignments. For any course, if a student submitted the assignment and not attended the viva-voce, then the assignment is treated as not successfully completed and would be marked as ZERO.

Course Code	:	MCS-208
Course Title	:	Data Structures and Algorithms
Assignment Number	:	MSCAIML(I)/208/Assign/2026
Maximum Marks	:	100
Weightage	:	23%
Last Date of Submission	:	31st October, 2026 (for July 2026 Session)

There are four questions in this assignment, which carry 80 marks. Each question carries 20 marks. Rest 20 marks are for viva voce. All algorithms should be written nearer to C programming language. You may use illustrations and diagrams to enhance the explanations, if necessary. Please go through the guidelines regarding assignments given in the Programme Guide for the format of presentation.

- Q1:** Write an algorithm to list the data fields of the nodes of a binary tree by level. Within levels, nodes are to be listed left to right.
- Q2:** Show that every tree is a bipartite graph.
- Q3:** Consider a hypothetical data object X1. X1 is a linear list with the restriction that while additions to the list may be made at either end, deletions can be made from one end only. Design a linked list representation for X1. Write addition and deletion algorithms for X1. Specify initial and boundary conditions for your representation.
- Q4:** Write an algorithm to list all the identifiers in a hash table in lexicographic order. Assume the hash function f is $f(X)$ = first character of X and linear probing is used. How much time does your algorithm take?