

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-081
Course Title : Artificial Intelligence
Assignment Number : MSCAIML(I)/081/Assign/2026
Maximum Marks : 100
Weightage : 30%
Last Dates for Submission : 31st October, 2026 (for July 2026 Session)

Note: There are 13 questions in this assignment, carrying a total of 80 marks. The remaining 20 marks are for viva-voce. Answer all the questions.

Q1: How does knowledge differ from intelligence? What do you understand by the term Artificial Intelligence (AI)? List the various technologies and their corresponding illustrative solutions.

(8 Marks)

Q2: What is the Turing Test? What is the criticism of the Turing Test?

(4 Marks)

Q3: Find the minimum cost path for the 8-puzzle problem, where the start and goal state are given as follows:

(5 Marks)

1	2	3
4	8	-
7	6	5

Start State

1	2	3
4	5	6
7	8	-

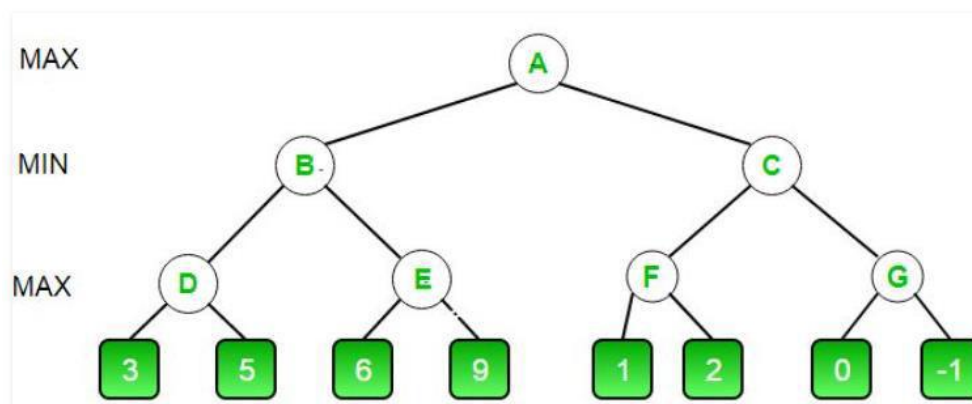
Goal State

Q4: Draw a state space tree representation to solve the Tower of Hanoi problem. (Take the number of disks $n=4$)

(5 Marks)

Q5: Apply Alpha-Beta pruning algorithm on the following graph and find which node(s) are pruned?

(5 Marks)



- Q6:** Write WFF for the following statements: **(5 Marks)**
a) Every Person has Mother
b) There is a woman and she is mother of Siya
- Q7:** Let $P(x)$ and $Q(x)$ represent “ x is a rational number” and “ x is a real number,” respectively. Symbolize the following sentences: **(6 Marks)**
(i) Every rational number is a real number.
(ii) (Some real numbers are rational numbers.
(iii) Not every real number is a rational number.
- Q8:** Explain the following rule-based systems with the help of an example: **(8 Marks)**
a) *Forward chaining systems*,
b) *Backward chaining systems*.
- Q9:** Explain the Dempster-Shafer theory with a suitable example. **(8 Marks)**
- Q10:** Using the following information, determine your choice between Action C (certain) or Action G (gamble) based on expected monetary value. **(6 Marks)**
Action C (certain): receive Rs.50 for sure.
Action G (gamble): 80% chance of Rs.100 and 20% chance of complete loss.
- Q11:** Define an expert system. Discuss the components of a generic expert system shell. **(8 Marks)**
- Q12:** Define the following forms of learning in an agent. **(6 Marks)**
(i) Rote learning or memorization
(ii) Learning through instruction
(iii) Learning by analogy
(iv) Learning by induction
- Q13:** Write Python code to do statistical analysis (average, min, max, standard deviation) of your marks in 5 subjects (user input). **(6 Marks)**