Printed page: 3 **Subject Code: CMICSAI0101**

Roll No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech Integrated

SEM: I - THEORY EXAMINATION (2025-2026)

Subject - Fundamentals of Artificial Intelligence

Time: 2 Hours **Max. Marks:50**

General Instructions:

IMP: Verify that you have received question paper with correct course, code, branch etc.

1. *This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*
2. *Maximum marks for each question are indicated on right hand side of each question.*
3. *Illustrate your answers with neat sketches wherever necessary.*
4. *Assume suitable data if necessary.*
5. *Preferably, write the answers in sequential order.*
6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION – A 15

1. Attempt all parts:-

1-a. The method of machine learning are: (CO1)(K1) 1

(a) Supervised learning

(b) Unsupervised learning

(c) Reinforcement learning

(d) All of the above

1-b. Data Cleaning means: (CO2)(K1) 1

(a) Removing irrelevant or incorrect data

(b) Deleting entire datasets

(c) Adding fake values

(d) Encrypting data

1-c. Python is ___ typed language: (CO3)(K1) 1

(a) strongly

(b) weakly

(c) dynamically

(d) statistically

1-d. A logistics company wants to reduce fuel use. They should apply (CO4)(K1) 1

(a) AI-based route optimization

(b) Employee training only

(c) New uniforms

(d) Vehicle repainting

1-e. Robots in warehouses improve operations by: (CO4)(K1) 1

(a) Moving faster and reducing errors

(b) Stopping inventory

(c) Taking breaks

(d) Hiding products

2. Attempt all parts:-

2.a. Define Artificial Intelligence? (CO1)(K1) 2

2.b. Define Information? (CO2)(K1) 2

2.c. Define Tuple? (CO3)(K1) 2

2.d. Define List? (CO3)(K1) 2

2.e. List any 4 applications of AI in Entertainment & Media. (CO4)(K1) 2

SECTION – B 15

3. Answer any <u>three</u> of the following-

3-a. Discuss all types of agents in AI and explain any 2 with their respective model diagram. (CO1)(K2) 5

3-b. Explain Structured & Unstructured data in detail with examples. (CO2)(K2) 5

3-c. The ages of students are: 10, 11, 12, 11, 13, 11, 11. Solve for Mean, Median, and Mode. (CO2)(K3) 5

3-d. Apply the matplotlib library in Python to create a simple scatter plot using the given data values: 5
x = [1, 2, 3, 4, 5] and y = [1, 2, 3, 8, 10].
Write a complete Python program to plot the data with appropriate labels for the X-axis and Y-axis. Also explain briefly how matplotlib is used to create a scatter plot and how the given data is represented on the graph. (CO3)(K3)

3-e. A bank is testing two fraud detection systems: one that uses quick rule-based checks with machine learning, and another that relies on a larger, more complex AI model. Analyze the differences in Speed, accuracy, and Cost between the two systems, and suggest which option would be more suitable for a medium-sized bank with limited resources. (CO4)(K4) 5

SECTION – C 20

4. Answer any <u>five</u> of the following-

4-a. Explain the four major approaches to AI with examples (CO1)(K2) 4

4-b. Discuss the main stages in the development of AI, starting from its early foundations and continuing to the present day. (CO1)(K2) 4

4-c.	A streaming platform like Netflix uses user watch history and movie posters. Classify the data and explain its role in recommendation systems. (CO2)(K2)	4
4-d.	Illustrate the DIKW pyramid with examples . (CO2)(K3)	4
4-e.	Discuss atleast 5 differences between NumPy, Pandas & Matplotlib libraries (CO3)(K2)	4
4-f.	Using your knowledge of the Pandas library in Python, apply appropriate commands to create a DataFrame from the given dataset: {'Name': ['A', 'B', 'C'], 'Age': [26, 30, 36]}. (CO3)(K3)	4
4-g.	Explain any 4 applications of AI in Agriculture. (CO4)(K2)	4
4-h.	In education, analyze how personalized learning by analyzing student performance data and suggesting tailored study plans improves engagement and outcomes. What risks arise if the model is biased or inaccurate. (CO4)(K3)	4