Pandit Deendayal Energy University

Department of Civil Engineering

Assignment 1

Introduction to Artificial Intelligence (24CV201T)

Total Questions: 10
Submission Deadline: 30 October 2026
Submission Format: Handwritten submissions only.

Instructions

1. Answer all questions in your own words.
2. Support your answers with suitable diagrams, examples, or case studies wherever applicable.
3. Do not copy directly from AI tools or websites. Proper references must be provided if external sources are used.
4. Each answer should be approximately **200–400 words** unless otherwise specified.
5. Neat presentation and technical accuracy will be considered during evaluation.

Unit 1 – Foundations of AI in Civil Engineering

Q1. Explain the concept of Artificial Intelligence. Discuss how AI differs from traditional computer programming.

Q2. Differentiate between Artificial Intelligence, Machine Learning, and Deep Learning using suitable examples from civil engineering.

Q3. Describe the Data Science Lifecycle. Explain the importance of each stage in developing an AI solution.

Q4. Compare Narrow AI and Generative AI. Discuss one practical engineering application of each.

Q5. What are Foundation Models and Large Language Models (LLMs)? Explain their potential role in engineering education and practice.

Q6. Explain the three major machine learning paradigms:

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

Provide one engineering example for each.

Q7. Discuss five real-world applications of AI in civil engineering and explain how AI improves decision making.

Q8. Explain the role of AI in water resources engineering. Discuss its applications in flood forecasting, rainfall prediction, drought monitoring, and groundwater modeling.

Q9. Discuss how AI and geospatial technologies work together for land use classification, flood mapping, and infrastructure monitoring.

Q10. Why is Ethical AI important? Explain the concepts of bias, explainable AI (XAI), and data privacy with engineering examples.