

Pandit Deendayal Energy University
Department of Civil Engineering
Assignment 2
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 2 – Statistics and Exploratory Data Analysis

Q11. Explain the importance of statistics in Artificial Intelligence and Machine Learning.

Q12. Differentiate among numerical, categorical, time-series, and spatial data with engineering examples.

Q13. Explain the following descriptive statistics and discuss their importance:

- Mean
- Median
- Mode
- Variance
- Standard Deviation
- Quartiles

- Q14. Discuss the role of probability in engineering risk assessment with suitable examples.
- Q15. Explain the purpose of Exploratory Data Analysis (EDA). Why is EDA considered an essential step before model development?
- Q16. Describe different visualization techniques including scatter plots, histograms, boxplots, density plots, violin plots, heatmaps, and correlation matrices. State when each should be used.
- Q17. Discuss common data quality problems and explain methods to handle missing values, duplicate records, and outliers.
- Q18. Explain how feature relationships can be identified using statistical methods and graphical visualization.
- Q19. Describe the complete workflow for analyzing an environmental dataset such as rainfall records using EDA.
- Q20. Explain why data visualization is important in communicating engineering insights to decision-makers.