

Atal Bihari Vajpayee Indian Institute of Information Technology & Management, Gwalior

IT306: Machine Learning

Minor Examination (Session 2023–24)

Maximum Time: 1.5 Hours

Max Marks: 25

Note: Attempt all questions. Illustrations and examples will fetch more marks.

1. Explain the difference between supervised, unsupervised, and reinforcement learning with examples. (5 Marks)
2. The following data points are given: $(x_1, y) = (1, 2), (2, 4), (3, 6), (4, 8)$. Fit a simple linear regression model $y = w_0 + w_1x$ and compute parameters using least squares. (6 Marks)
3. What are the main differences between decision trees and random forests? (4 Marks)
4. Explain k -means clustering. Apply one iteration for data points $(2, 3), (3, 3), (6, 8), (7, 9)$ with $k = 2$. (6 Marks)
5. Write short notes on: (a) Overfitting and underfitting (b) Confusion matrix (4 Marks)