Roll No. ..... Total Pages : 3

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BT-6/M-24

APPLIED MACHINE LEARNING

Paper–PC-CS-AIML-304A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all by selecting at least *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) What is the significance of domain knowledge when applying machine learning algorithms to real-world problems? (8)

(b) Explain the role of basic linear algebra in various machine learning techniques. (7)

2. (a) What is supervised learning? How do bias and variance impact the performance of supervised learning models? (8)

(b) What are some commonly used metrics for assessing regression accuracy in supervised learning tasks? (7)

UNIT–II

3. (a) How does multiple linear regression differ from simple linear regression, and when is it more appropriate to use? (8)

(b) What is logistic regression, and how is it utilized classification tasks? (7)

4. (a) What is Gradient Descent, and how is it used to optimize models in machine learning? (8)

(b) Explain Bayesian reasoning as a probabilistic approach to inference and its applications in machine learning. (7)

UNIT–III

5. (a) What are the underlying principles of the K-Nearest Neighbor (KNN) algorithm, and how does it classify data points based on their proximity to other instances? (8)

(b) Describe the Linear Discriminant Analysis (LDA) algorithm and its application in dimensionality reduction and classification tasks. (7)

6. (a) What are the foundational principles behind Support Vector Machines (SVMs), and how do they differ from other machine learning algorithms? (8)

(b) How can a multiclass classification problem be effectively decomposed into a series of binary classification tasks? Explain using suitable example. (7)

UNIT–IV

7. Provide an overview of basic clustering methods, such as K-means clustering and Gaussian mixtures clustering, and discuss their respective advantages and limitations. (15)

8. (a) What is Principal Component Analysis and How it Works? (8)

(b) Explain the concept of unsupervised learning and how it differs from supervised learning. (7)