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BT-6/M-24

APPLIED MACHINE LEARNING
Paper–PC-CS-AIDS-308A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions from all and selecting at least *one* from each unit.

UNIT–I

1. Explain feature engineering techniques for structured and unstructured data and explain how they contribute to improving model performance. (15)

2. Using a dataset of your choice, describe the process of conducting both descriptive and inferential statistical analysis. (15)

UNIT–II

3. How does the choice of model complexity impact bias, variance, and overfitting? Can you discuss scenarios where a more complex model may lead to overfitting and situations where a simpler model may underfit? (15)

4. Explain the concept of kernel trick in SVM and how it transforms a non-linearly separable problem into a linearly separable one. Provide examples of commonly used kernel functions and discuss their suitability for different types of datasets. (15)

UNIT–III

5. Consider a dataset containing attributes with varying levels of entropy. Discuss how you would approach attribute deserialization using entropy-based methods. Provide a detailed explanation of the steps involved, including the calculation of entropy for each attribute. (15)

6. Explain the concept of variance explained in PCA and how it is utilized in determining the optimal number of principal components to retain. (15)

UNIT–IV

7. Discuss the limitations of multilayer perceptrons in solving complex nonlinear problems and outline potential strategies to overcome these limitations. (15)

8. Compare and contrast the Mamdani fuzzy inference system with other fuzzy inference models. Explain the strengths and weaknesses of the Mamdani model in terms of computational complexity. (15)