Roll No. ..... Total Pages : 03

BT-5/D-23 45264

MACHINE LEARNING WITH USING PYTHON

PS-CS-AIDS-307A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) What is the difference between a tuple and a list in Python ? Discuss.

   (b) What is a lambda function in Python, and how are they used ? Discuss.

2. (a) How can you iterate through the elements of a list in Python ? Illustrate.

   (b) Explain the Python Global Variable and Local Variable scope rules. How does variable scoping work when dealing with nested functions ? Discuss.

Unit II

3. (a) How do you open a file in Python, and what modes can you use when opening a file ? Illustrate.

   (b) Describe the significance of NumPy and Pandas in data preprocessing and feature engineering for machine learning.

4. (a) How can you read data from common file formats (e.g., CSV, Excel, SQL databases) using Pandas ?

   (b) Explain the concept of labeled data in supervised learning. Why is it important, and where does the label information come from ?

Unit III

5. (a) Discuss the limitations and challenges of using SVMs in large-scale datasets and high-dimensional feature spaces.

   (b) What is the k-Nearest Neighbors (k-NN) algorithm, and how does it work in classification and regression tasks ?

6. (a) Explain the difference between linear regression and logistic regression. What types of problems are they best suited for ?

   (b) How does the k-means algorithm update the cluster assignments of data points and the centroids in each iteration ? Discuss.

Unit IV

7. (a) Describe the key features of System ML that differentiate it from other machine learning libraries.

   (b) What are some real-world applications and use cases of System ML in industry or research ?

8. (a) What types of machine learning algorithms and tasks can be implemented using System ML ? Discuss.

   (b) How does System ML address the challenges of handling large datasets in machine learning ? Discuss.