CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

21EC744

Seventh Semester B.E./B.Tech. Degree Examination, June/July 2025

Machine Learning with Python

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Explain machine learning. Discuss the different types of machine learning in detail. **(10 Marks)**

b. Discuss the operation of machine learning on predictive modeling with help of neat block diagram. **(10 Marks)**

OR

2 a. Explain the adaline linear neurons and the convergence of learning. **(10 Marks)**

b. Explain the Perceptron learning rule and derive the net input expression. **(10 Marks)**

Module-2

3 a. Describe the step by step operation of logistic regression with the help of neat diagram. **(10 Marks)**

b. Explain the concepts of support vector machine and decision tree learning. **(10 Marks)**

OR

4 a. Derive the expression for learning the weights of the logistic cost function. **(10 Marks)**

b. Explain the concepts of overfitting and underfitting problem in machine learning. **(10 Marks)**

Module-3

5 a. Describe the operation of principal component analysis method in detail. **(10 Marks)**

b. Explain the inner working of linear discriminant analysis in detail. **(10 Marks)**

OR

6 a. Explain partitioning of dataset into training and test dataset. **(10 Marks)**

b. Discuss the various operation of performance evaluation metrics. **(10 Marks)**

Module-4

7 a. Develop a python code to create a new SQLite database inside the movie classifier directory and store two example movie reviews. **(10 Marks)**

b. Explain the mathematical formulation of a simple linear regression model with neat diagram. **(10 Marks)**

OR

8 a. Describe the algorithms step involved in fitting a robust regression model using RANSAC. **(10 Marks)**

b. What metrics are commonly used to evaluate the performance of linear regression models? **(10 Marks)**

Module-5

9 a. Explain K-means clustering algorithm and how does it group objects based in similarity. **(10 Marks)**

b. What is hierarchical clustering and demonstrate the working with the help of an example. **(10 Marks)**

OR

10 a. Explain the working multilayer neural network architecture. **(10 Marks)**

b. Explain the process of back propagation and how it updates weights during training. **(10 Marks)**

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