



**K. K. Wagh Institute of Engineering Education & Research, Nashik**  
(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:V
Class:TY	Program:B.Tech
Branch Code:ETC	Pattern:2023
Name of Course:Foundation course in ML	Course Code:2302306D
Max. Marks:60	Duration:2.30 Hrs.

**Instructions:** Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

**Marks CO**

**Question No. 1**

- 1a) What are the different types of machine learning? (6) CO1

**Question No. 2**

- 2a) Describe any three feature selection techniques and explain how they help in improving model efficiency. (6) CO2

**Question No. 3**

- 3a) Explain the working of gradient descent for optimizing the linear regression cost function. (8) CO3

**OR**

- 3b) Explain the concept of a Random Forest and how it improves the performance of a single decision tree. (8) CO3

- 3c) Differentiate between Gaussian, Multinomial, and Bernoulli Naïve Bayes classifiers with suitable examples. (8) CO3

**OR**

- 3d) Differentiate between linear regression and logistic regression in terms of hypothesis, output, and applications. (8) CO3

**Question No. 4**

- 4a) Demonstrate in Python how PCA can be used for Noise Reduction in Images. (8) CO4

**OR**

- 4b) Define Dimensionality Reduction and explain why it is important in machine learning. (8) CO4

- 4c) Demonstrate Market Segmentation using k-Means clustering on a dataset containing Customer Age, Annual Income, and Spending Score. (8) CO3

**OR**

- 4d) Write Python code to demonstrate how Dimensionality Reduction (PCA) helps improve the performance of a classifier. (8) CO4

**Question No. 5**

- 5a) Discuss how Precision and Recall are affected in imbalanced datasets. Give an example with Python code to demonstrate the imbalance problem (8) CO5

**OR**

- 5b) Write a Python program to demonstrate Overfitting and Underfitting using a polynomial regression model. (8) CO5

- 5c) Differentiate between K-Fold Cross-Validation and Stratified K-Fold Cross-Validation. (8) CO5

**OR**

- 5d) Compare ROC Curve and Precision-Recall Curve. When is each more appropriate to use? (8) CO5

**..... End of question paper.....**