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 is Machine Learning and how is it different from traditional programming?	(6)	CO1
Question No. 2			
2a)	Explain any three methods for handling missing values in a dataset with suitable Python examples.	(6)	CO2
Question No. 3			
3a)	State and explain **Bayes' theorem**. How does the Naïve Bayes classifier use it for classification?	(8)	CO3
	OR		
3b)	Describe how a decision boundary is formed in logistic regression and its importance.	(8)	CO3
3c)	Explain the working principle of the K-Means. Discuss the **advantages and disadvantages** of the k.	(8)	CO3
	OR		
3d)	Explain the working of **gradient descent** for optimizing the linear regression cost function.	(8)	CO3
Question No. 4			
4a)	Demonstrate **Market Segmentation** using k-Means clustering on a dataset containing Customer Age, Annual Income, and Spending Score.	(8)	CO4
	OR		
4b)	Write Python code to demonstrate how **Dimensionality Reduction (PCA)** helps improve the performance of a classifier.	(8)	CO4
4c)	Write Python code for Image Compression using k-Means clustering (on a sample image).	(8)	CO4
	OR		
4d)	Explain the use of clustering in Market Segmentation with a real-life example.	(8)	CO4
Question No. 5			

5a)	Differentiate between K-Fold Cross-Validation and Stratified K-Fold Cross-Validation with Real life example.	(8)	CO5

OR

5b)	Differentiate between Overfitting and Underfitting in machine learning. Explain their impact on model performance using a training vs validation curve.	(8)	CO5
5c)	What is the ROC Curve? How is AUC used to evaluate model performance?	(8)	CO5

OR

5d)	Write a short notes on Accuracy, Precision, Recall, and F1-Score.Explain its impact with real life example	(8)	CO5

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