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:III
Class:PG-II	Program:MCA
Branch Code:M.C.A.	Pattern:2022
Name of Course:Machine Learning	Course Code:MCA223002
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) Explain the working principles of Supervised and Unsupervised Learning with suitable examples. (6) CO1

Question No. 2

2a) Demonstrate any three methods for handling missing values in a dataset with suitable examples. (6) CO2

Question No. 3

3a) Illustrate the different strategies for multiclass classification: One vs One (OvO) and One vs Rest (OvR). (8) CO3

OR

3b) Apply KNN on the following data and classify the new sample (3,7) to the respective class. Consider K=3 (8) CO3

X	Y	Class
7	7	Pass
7	4	Pass
3	4	Fail
1	4	Fail
4	3	Fail
6	7	Pass

3c) The values of independent variable x and dependent value y are given below: (8) CO3

X	Y
0	2
1	3
2	5
3	4
4	6

Find the least square regression line y=mx+b. Estimate the value of y when x is 10.

OR

3d) Demonstrate Naïve Bayes Classifier with suitable example. (8) CO3

Question No. 4

4a) Illustrate linkage methods used in hierarchical clustering. (8) CO4

OR

4b) Given two points A(2, 3) and B(5, 7). Compute the Euclidean distance, Manhattan distance between them. Explain how this metric represents the straight-line distance in multidimensional space. (8) CO4

4c) Demonstrate the working of the K-Means clustering algorithm using a small dataset. Explain how the drawbacks of K-Means are overcome by the K-Medoid algorithm. (8) CO4

OR

4d) Compare the working of Agglomerative and Divisive hierarchical clustering (8) CO4

Question No. 5

5a) A database has five transactions. Find all frequent itemsets using Apriori algorithm with min sup = 3 (8) CO5

Transactions	Items Bought
T1	A, B, C
T2	A, B, C, D, E
T3	A, C, D
T4	A, C, D, E
T5	A, B, C, D

OR

5b) Compare and contrast the conceptual and practical challenges of implementing data mining. (8) CO5

5c) Illustrate the KDD process model using a neat diagram and explain each phase in detail. (8) CO5

OR

5d) Differentiate between frequent pattern, support, confidence, and lift measures in association rule mining. (8) CO5

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