



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:IV
Class:SY	Program:B.Tech
Branch Code:MEC	Pattern:2023
Name of Course:Machine Intelligence	Course Code:2305216
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 how supervised, unsupervised, and reinforcement learning differ in terms of data input and feedback mechanism. (6) CO1

Question No. 2

- 2a) Differentiate between feature selection and feature extraction techniques with suitable examples. (6) CO1

Question No. 3

- 3a) A company purchases raw materials from two suppliers: Supplier X and Supplier Y. The 60% of the total material is purchased from Supplier X, and 40% from Supplier Y. The probability that material from Supplier X is defective is 0.03, while from Supplier Y it is 0.06. A randomly selected material is found to be defective. Using Bayes Theorem, find the probability that the defective material came from Supplier X. (8) CO4

OR

- 3b) A maintenance dataset contains 8 readings with attributes Load, Lubrication, and class Bearing Condition. Compute the Information Gain of the attribute Load for predicting Bearing Condition (8) CO4

Load	Lubrication	Condition
High	Poor	Faulty
Low	Good	Good
Medium	Good	Good
High	Good	Good
Medium	Poor	Faulty
Low	Poor	Faulty
High	Poor	Faulty
Medium	Good	Good

- 3c) How do ARIMA, SARIMA, and LSTM models differ in handling time series data? (4) CO4

OR

- 3d) Explain the Support Vector Machine (SVM) algorithm? (4) CO4

3e) Explain the steps involved in Regression algorithm? (4) CO4

OR

3f) Explain any one Algorithm used for classification in machine learning? (4) CO4

Question No. 4

4a) A CNC machine defect classifier gives the following results: (8) CO4, CO5

Correctly classified defects: 55

Correctly classified non-defects: 42

Incorrectly marked non-defects as defects: 8

Failed to detect defects: 15

Calculate Accuracy, Precision, Recall, and F1-Score.

OR

4b) A regression model is used to estimate the outlet temperature of a heat exchanger. The actual and predicted values are: (8) CO4, CO5

Actual: [60, 55, 50, 65]

Predicted: [58, 57, 52, 70]

Calculate MSE, RMSE, MAE, and R² Score.

4c) Explain in detail the algorithm used for an image classification task. (4) CO4, CO5

OR

4d) What are the different activation functions used in a neural network? (4) CO4, CO5

4e) Explain Max Pooling and Average pooling used in CNN. (4) CO4, CO5

OR

4f) Describe the Process of the development of the Machine Learning model. (4) CO4, CO5

Question No. 5

5a) Explain how IoT, cloud computing, and AI together enable Digital Twin technology. (8) CO2

OR

5b) Define transfer learning and explain how knowledge is transferred between the source and target tasks. (8) CO2

5c) Describe the concept of Reinforcement Learning with its merits and demerits with suitable example. (8) CO2

OR

5d) Describe the application of Machine Learning in fault detection. How does ML help in preventing equipment failure? (8) CO2

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