

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION SP/2025)

CLASS: BCA
BRANCH: CS

SEMESTER : VI
SESSION : SP/2025

SUBJECT: CA373 INTRODUCTION TO OF MACHINE LEARNING

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

Q.1(a)	How do food delivery apps are using machine learning. Explain.	[2]	CO	BL
Q.1(b)	What is machine learning? Describe and differentiate supervised and unsupervised machine learning methods. Provide two real-world application examples for each type.	[3]	CO1	4
			CO2	2
Q.2(a)	What is semi supervised learning? Why is semi supervised learning required? Explain.	[2]	CO2	2
Q.2(b)	What is eigenvalue decomposition, and why is it useful in machine learning? Compute the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 4 & 2 \\ 1 & 3 \end{bmatrix}$.	[3]	CO1	3
Q.3(a)	Explain with an example of how linear regression is used for prediction. What are the assumptions of linear regression methods?	[2]	CO2	1
Q.3(b)	Explain the gradient descent method for linear regression. What is the significance of learning rate in gradient descent? How does a high or low learning rate affect the training process?	[3]	CO3	3
Q.4(a)	How is the probability of class labels computed in logistic regression? Explain using a suitable example.	[2]	CO2	2
Q.4(b)	Find the coefficients for a linear regression model using MSE to predict return on investment of Gold, for the given time.	[3]	CO4	3

X (Time in Yrs.)	2	4	6	8	10
Y (Return in %)	21	48	58	90	98

Q.5(a)	Differentiate classification and prediction? What are the major issues in classification?	[2]	CO2	2
Q.5(b)	What is entropy? Compare various entropy-based attribute selection measures used in the decision tree algorithms. Explain the steps involved in training a Decision Tree classifier.	[3]	CO3	2

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