

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: MTech
BRANCH: CSE**

**SEMESTER : I
SESSION : MO/2025**

SUBJECT: CS535 MACHINE LEARNING

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Differentiate between supervised, unsupervised, and reinforcement learning.	[5] 1	4
Q.1(b)	Define Linear Regression. Explain the meaning and importance of the error term in a Linear Regression model.	[5] 1	1,2,3
Q.2(a)	Define feature selection. Explain Filter method of feature selection.	[5] 2	1,2
Q.2(b)	Explain the working principle of a Decision Tree classifier with an example.	[5] 2	2
Q.3(a)	Define a Neural Network. Explain its basic structure and components.	[5] 3	1,2
Q.3(b)	Explain the function of hidden layers in a Neural Network.	[5] 3	2
Q.4(a)	Define clustering and explain its objective in unsupervised learning.	[5] 4	1,3
Q.4(b)	Explain the K-means clustering algorithm with an example.	[5] 4	2
Q.5(a)	Explain Expectation-Maximization (EM) algorithm for soft clustering.	[5] 4	2
Q.5(b)	What are ensemble methods in machine learning? Why are they used?	[5] 5	2,3

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