

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

**CLASS: BCA
BRANCH: BCA**

**SEMESTER : V/ADD
SESSION : MO/2025**

SUBJECT: CN303 INTRODUCTION TO 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.
-

		CO	BL
Q.1(a)	What is learning and its types in ML? Compare unsupervised and semi- supervised learning. with example.	[5] 1	1
Q.1(b)	What is Eigen value Decomposition? Explain the importance of Eigen value Decomposition.	[5] 1	1
Q.2(a)	Explain filter, wrapper, and embedded methods with examples.	[5] 1	1
Q.2(b)	Describe Principal Component Analysis (PCA) and its significance. What is the Kernel Trick in SVM.	[5] 1	2
Q.3(a)	What is logistic regression? Explain with suitable example. What is the sigmoid function, and why is it used in logistic regression?	[5] 2	2
Q.3(b)	Explain the concept of Support Vector Machine (SVM) and hyperplane separation	[5] 1	1
Q.4(a)	Apply one iteration of K-Means with Data points: (1,1), (2,1), (4,3), (5,4) Initial centroids: C1 = (1,1), C2 = (5,4).What are the values of the final cluster Assignments.	[5] 4	3
Q.4(b)	A classification algorithm has the following confusion matrix outcomes for a test set of 100 instances: 60 True Positives (TP), 10 False Positives (FP), 5 False Negatives (FN), and 25 True Negatives (TN). A model's performance is then evaluated using metrics derived from these values, such as precision, recall, and F1-score.	[5] 4	3
Q.5(a)	Explain Artificial Neural Network (ANN). Describe its basic structure. What is an example of a neural network in real life?	[5] 1	1
Q.5(b)	Illustrate the single layer Perceptron model of neural network by taking a single neuron model with its learning mechanism. What kind of problem it can solve? Explain with examples.	[5] 1	1

:::20/11/2025:::M