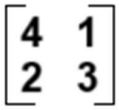
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BCA **SEMESTER : V**
BRANCH: BCA **SESSION : MO/2024**

SUBJECT: CA333 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)	Explain the term machine learning with some application areas where the ML is applied.	[5]	1	1
Q.1(b)	Explain the Eigen value decomposition by taking the following matrix:  Find the eigen value and eigen vectors	[5]	1	3
Q.2(a)	A linear regression line is given as: y = 2x + 5. You are given the following points as (1, 7), (2, 8), (3, 11), (4, 12), and (5, 16). Find out the total squared error for these all points by calculating the predicted values using the regression line.	[5]	2	3
Q.2(b)	Explain the role of Logistic function with its formula in the logistic regression. Also explain why logistic function is not suitable directly for multi class classification.	[5]	2	2
Q.3(a)	Explain the principle of Support Vector Machine (SVM) classifier with suitable sketch. Explain also the kernel trick for dealing with non-linearly separable data classification.	[5]	3	4
Q.3(b)	Explain the confusion matrix to judge the performance of a classifier by taking suitable example. How can we find the Accuracy, Precision and Recall from the confusion matrix data.	[5]	3	4
Q.4(a)	Explain the Bias and Variance problem in the machine learning modeling. How can we solve the problem of overfitting in ML modeling?	[5]	4	3
Q.4(b)	Explain the difference between Algomerative and Divisive clustering with suitable sketch. What is the role of dendogram in the clustering?	[5]	4	3
Q.5(a)	Explain the concept of artificial neural network with neat and clean diagram. Also list the uses of artificial neural network.	[5]	5	3
Q.5(b)	Explain the learning algorithm of Single Layer Perceptron Model of artificial neural network. What are the advantages of Multi layer perception model over the single layer precption model? Explain it.	[5]	5	4

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