Paper / Subject Code: 89325 / : Machine Learning (DLOC)

TE Sem VI (R-2019 C scheme) ECS Dec'23

20/12/2023

Duration: 3hrs

[Max Marks:80]

N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 Attempt **any FOUR**

a Explain Applications of Machine Learning **[20]**

b Explain different types of activation functions with formula.

c Explain Quality of Model with respect to Confusion Matrix, Accuracy, Recall, Precision.

d Justify Perceptron works only for linear separable problems.

e Explain Feature Selection and Extraction concept for dimensionality reduction.

2 a Explain McCulloch-Pitts Model for different logic gates like: AND, OR, NAND and NOR gate. **[12]**

b Describe expectation maximization algorithm. **[8]**

3 a Explain Issues in Machine Learning Applications. **[10]**

b What are the eigenvectors? What are the significance of eigenvectors in Dimensionality Reduction **[10]**

4 a Explain backpropagation algorithm. **[10]**

b Perform Linear regression on the following two-dimensional data. X is an independent variable while Y is a dependent variable. **[10]**

X	1	1	1	2	3	3	4	5	5
Y	9	7	8	10	15	12	19	24	21

5 a What is Regularized Regression? Explain Logistic regression in detail. **[10]**

b Explain Delta Learning Rule (LMS-Widrow Hoff) with example for AND gate (Note: Bipolar AND gate). Min one epoch is required. **[10]**

6 a Explain the following types of NN Architecture **[10]**

I) Single layer feed forward network

II) Multilayer feed-forward network

III) Single node with its own feedback

IV) Single-layer recurrent network

V) Multilayer recurrent network

b Explain the steps involved in principal component analysis. **[10]**

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