TE Sem VI (R-2019 C Scheme) "AI & DS" May '23

16/5/23

Time: 3 Hours **Max. Marks: 80**

Note: 1. Q.1 is Compulsory.
2. Attempt any 3 from remaining
3. Assume suitable data if necessary

Q.1 Solve **any Four**

A. What is Machine Learning? What are the steps in developing a machine learning application? [05]

B. Differentiate between supervised and unsupervised learning. [05]

C. Draw and explain biological neural networks and compare them with artificial neural networks. [05]

D. Explain in detail the MP neuron model. [05]

E. Explain the overfitting and underfitting with example [05]

Q.2

A. Draw a block diagram of the Error Back Propagation Algorithm and explain with the flow chart the Error Back Propagation Concept. [10]

B. The values of independent variable X and the dependent variable Y are given below

X	Y
0	2
1	3
2	5
3	4
4	6

Find the least square regression line Y=aX+b. Estimate the Y when the value of X equals 10. [10]

Q.3

A. Diagonalize the matrix A

$$\begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$$

B. List out and explain the applications of SVD

C. Write short note on maximum expectation algorithm

D. What are Activation functions? Explain the Binary, Bipolar, Continuous, and Ramp activation functions.

4.

A. Write a short note on (a) Multivariate Regression and (b) Regularized Regression.

B. What is the curse of Dimensionality? Explain the PCA dimensionality reduction technique in detail

Q. 5

A. Design a Hebb net to implement OR function (consider bipolar inputs and targets)

B. Draw Delta Learning Rule (LMS-Widrow Hoff) model and explain it with a training process flowchart.

Q. 6. Write short note on any FOUR

A. Least Square Regression for classification

B. Differentiate between Ridge and Lasso Regression

C. Artificial Neural Network

D. Feature selection methods for dimensionality reduction

E. Perceptron Neural Network

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