26-Dec-2023 10:30 am - 01:30 pm 1T01877 - B.E. Computer Science & Engineering (Artificial Intelligence & Machine Learning) (R-2019-20 C Scheme) (Sem VII) / 42371 - Deep Learning QP CODE: 10043892

Duration: 3Hrs. **Maximum Marks : 80**

NB:

(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.

Q1. ATTEMPT ANY FOUR. **[20]**

a. Design AND gate using Perceptron.

b. Suppose we have N input-output pairs. Our goal is to find the parameters that predict the output y from the input x according to some function $y= x^w$. Calculate the sum-of squared error function E between predictions y and inputs x. The parameter w can be determined iteratively using gradient descent. For the calculated error function E, derive the gradient descent update rule $w \leftarrow w-\alpha\frac{dE}{dw}$.

c. Explain dropout. How does it solve the problem of overfitting?

d. Explain denoising auto encoder model.

e. Describe sequence learning problem.

Q2. a. Explain Gated Recurrent Unit in detail. **[10]**

b. What is an activation function? Describe any four activation functions. **[10]**

Q3. a. Explain CNN architecture in detail. Suppose, we have input volume of 32*32*3 for a layer in CNN and there are ten 5*5 filters with stride 1 and pad 2; calculate the number of parameters in this layer of CNN. **[10]**

b Explain early stopping, batch normalization, and data augmentation. **[10]**

Q4 a. Explain RNN architecture in detail. **[10]**

b. Explain the working of Generative Adversarial Network. **[10]**

Q5 a. Explain Stochastic Gradient Descent and momentum based gradient descent optimization techniques. **[10]**

b. Explain LSTM architecture. **[10]**

Q6 a. Describe LeNET architecture. **[10]**

b. Explain vanishing and exploding gradient in RNNs. **[10]**

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