



School of Computer Science and Engineering

Fall Semester 2024-25

Continuous Assessment Test – I

SLOT: D1+TD1

Programme Name & Branch: B. Tech All

Course Name & Code: Deep Learning, BCSE332L

Class Number (s): VL2024250101756, VL2024250101747, VL2024250101753, VL2024250101745

Faculty Name (s): Dr. SUKANTA GHOSH, Dr. CHELLATAMILAN T, Dr. SAURABH AGRAWAL, Dr. KUMAR K

Exam Duration: 90 Min.

Maximum Marks: 50

Q. No.	Question	Max Marks
1.	Explain the gradient descent algorithm in DL with necessary diagram. Additionally elaborate how hyperparameters are settled in a complex DL network. 5+5	5+5=10
2.	In a newly installed process control unit the outcomes are continuously acquired and modeled by a DL software. Now they are not getting optimal decision boundary for multiclass object identification. As a consultant, describe how different non-linear activation functions will influence the network outcomes to achieve more efficiency.	10
3.	Consider a simple neural network given below. X_1 and X_2 are inputs to the network. H_3, H_4 are neurons in hidden layer and O_5 is the neuron in the output layer. Assume that all biases are zero and all the neurons have a sigmoid activation function. At a particular instance of time during training of the model, the values of inputs and weights are as shown in figure. Perform a forward pass and a backward pass on the network. Assume Error is calculated using, learning rate = 1.0 and actual output is 0.5.	10
4.	An AI company is going to develop a software for auto identification of language by analyzing human voice signals with a novel DL algorithm. At the initial stage to train the network with major 10 different languages they are facing huge problem with gradient descent algorithm. Specifically gradient descent algorithm is not being able to handle huge dataset that is being produced from loss optimization process. As a consultant engineer, demonstrate other methods beyond gradient descent algorithm to which will logically more robust to solve this problem.	10

5.	<p>A famous car manufacturing company is going to make a new type of SUV where sports mode has many terrain selection options like sand, mud, snow etc. The interesting part is that these terrain selection can be done manually at the same time there may be an automated function mode which will choose the terrain dynamically depending on sensor inputs. Now the company is making this automatic terrain selection function by implementing a complex DL algorithm. The DL targets high end capacity for auto-function by implementing bulk feature variations in large training set. To make training process robust but not too complex what regularization parameters can be implemented – explain in detail.</p>	10
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