

GUJARAT TECHNOLOGICAL UNIVERSITY

BE(MINOR)- SEMESTER-VI EXAMINATION – SUMMER 2025

Subject Code:116AG01

Date:10-06-2025

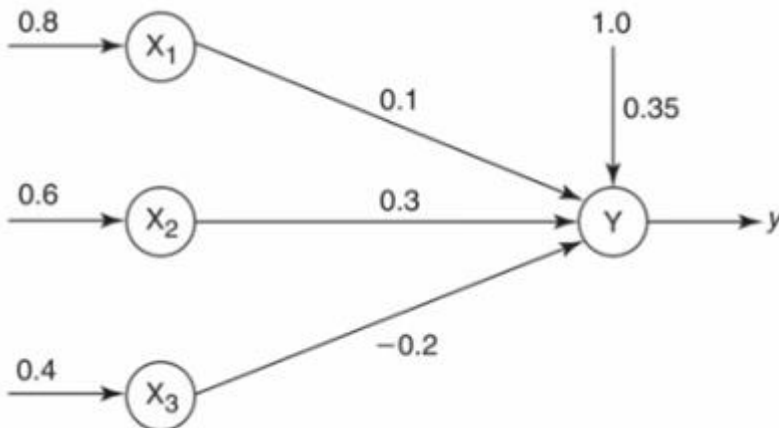
Subject Name:Deep Learning and Neural Network

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) List out the key components found in a neural network.	03
	(b) Explain the concept of perceptron with a neat diagram.	04
	(c) What is overfitting? Explain any three methods to prevent overfitting in neural networks.	07
Q.2	(a) Compare Artificial Neural Network with Biological Neural Network.	03
	(b) State difference between machine learning and deep learning	04
	(c) List and explain the various activation functions used in modeling of neural network.	07
	OR	
	(c) Explain Back propagation with its algorithm in Artificial Neural Network.	07
Q.3	(a) Describe the concept of batch normalization.	03
	(b) What are different loss functions and their use case?	04
	(c) Draw and explain the architecture of RNN	07
	OR	
Q.3	(a) Calculate the output of the following neuron Y with the activation function as a sigmoid activation function.	03
		
	(b) Compare Single layer perceptron and Multi layer perceptron.	04
	(c) Draw and explain the architecture of LSTM	07
Q.4	(a) Explain optimizers. Why optimizers are required?	03
	(b) Explain effect of learning rate in convergence of a neural network during training.	04
	(c) Draw and explain the architecture of Convolutional Neural Networks.	07

OR

- Q.4** (a) Write applications of Deep Learning. **03**
(b) Explain the role of pooling layer in CNN. Find Feature map after applying Maxpool 2 x 2 with stride=1 on the following feature map. **04**

12	1	5	1
6	9	0	0
7	5	1	8
0	3	6	5

- (c) Suppose 10000 patients get tested for flu; out of them 9000 are actually healthy and 1000 are actually sick. For the sick people, a test was positive for 620 and negative for 380. For healthy people, the same test was positive for 180 and negative for 8820. Construct a confusion matrix for the data and compute the accuracy, precision and recall for the data. **07**
- Q.5** (a) Explain TensorFlow components. **03**
(b) Write the differences between eager execution and graph execution modes in TensorFlow. **04**
(c) Discuss steps to implement CNN using Keras. **07**

OR

- Q.5** (a) Write steps to train neural network model. **03**
(b) Explain types of tensors. **04**
(c) Explain steps to train RNN using TensorFlow. **07**
