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Bengaluru

Mid Term Examinations - October 2026

Date: 07/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: CSE3016 **Course Name:** Neural Networks and Fuzzy Logic

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	46	44

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Differentiate between a biological neuron and an artificial neuron.	2	CO1	BT2
2	Define the perceptron learning rule.	2	CO1	BT1
3	What is an activation function? Explain the sigmoid and ReLU activation functions with a neat diagram.	2	CO1	BT2
4	State the limitation of a single-layer perceptron in solving the XOR problem	2	CO2	BT1
5	Describe the purpose of the radial basis function in an RBF network.	2	CO2	BT2

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Differentiate between the LMS algorithm and the Perceptron learning algorithm. Compare their error functions, learning rules, and weight-update mechanisms	10	CO1	BT1
7	Given an input vector [2,4], weight vector , bias , target output , theta = 1, and learning rate apply the Perceptron learning algorithm and calculate the updated weights and bias for three iterations.	10	CO1	BT3

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Explain the concept of learning rate in neural networks. Discuss the effect of choosing a very small or very large learning rate on the learning process.	10	CO1	BT2
9	Describe the architecture of feedforward and recurrent neural networks. Compare their information-flow mechanisms with a neat diagram	10	CO1	BT1

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	**There are 2 RBF neurons having centers c1=1 and c2=3 with sigma =1. Determine the value of y at x=2 for the given dataset** **x** | **y** **1** | **2** **3** | **6**	10	CO2	BT2

11	Describe the learning strategies used in Radial-Basis Function Networks. Explain the major steps involved in selecting centers, widths, and output weights.	10	CO2	BT2

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	Describe the back-propagation algorithm for training a multilayer perceptron. Explain the forward pass, error calculation, and backward weight update steps.	10	CO2	BT1
13	State the Kohonen Self-Organizing Map (SOM) algorithm and list its main steps, including initialization, winner selection, neighborhood determination, and weight adaptation.	10	CO2	BT1