Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 29-10-2025 **Time:** 02.30pm to 04.00pm

School: SOCSE/SOE	**Program:** B.Tech	
Course Code: CAI3428	**Course Name:** Practical Deep Learning with Tensor Flow	
Semester: VII	**Max Marks**: 50	**Weightage**: 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**26**	**24**			

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	Define a perceptron and identify its major components (weights, bias, activation).	**2 Marks**	**L1**	**CO1**
2	List the steps involved in the perceptron learning algorithm.	**2 Marks**	**L1**	**CO1**
3	Describe the purpose of the learning rate (η) in gradient descent.	**2 Marks**	**L2**	**CO1**
4	Write the mathematical expressions for Sigmoid, Tanh, and ReLU.	**2 Marks**	**L2**	**CO2**
5	Describe the vanishing gradient problem in DNNs.	**2 Marks**	**L2**	**CO2**

Part B

Answer the Questions. **Total Marks 40M**

6.	**a.**	Illustrate the architecture and working of a perceptron with a neat diagram.	**10 Marks**	**L3**	**CO1**
	b.	Demonstrate how a perceptron implements an OR gate using the given inputs.	**10 Marks**	**L3**	**CO1**
		Or			
7.	**a.**	Demonstrate the forward and backward pass of a 2-layer MLP using sigmoid activation for inputs [1, 0]. Hidden weights = [[0.1, 0.3], [0.2, 0.5]] Output weights = [0.6, 0.9], Target = 1	**10 Marks**	**L3**	**CO1**
	b.	Compute the error at the output and update the weights using backpropagation for one iteration.	**10 Marks**	**L4**	**CO1**

8.	**a.**	Compare activation functions — Sigmoid, Tanh, and ReLU — with equations and graphs.	**10 Marks**	**L3**	**CO2**
	b.	Compute the output of a 3-layer DNN with ReLU activation (Inputs X_1=0.6, X_2=0.4; Hidden weights [[0.2,0.4],[0.3,0.7]]; Output weights [0.5,0.9]; Hidden bias [0.1,0.2]; Output bias 0.3).	**10 Marks**	**L3**	**CO2**
		Or			
9.	**a.**	Illustrate the architecture of a Deep Neural Network and explain how it differs from MLP.	**10 Marks**	**L3**	**CO2**
	b.	Discuss major training problems in DNNs — vanishing gradient, exploding gradient, and overfitting.	**10 Marks**	**L3**	**CO2**