Code No.: R22CY701PC	R22	H.T.No.			8	R						

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
IV–B.TECH–I–Semester End Examinations (Regular) - December- 2025
DEEP LEARNING
(CSC)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(10 Marks)**

1. a)	Define Perceptron.	[1M]
b)	State any two uses of Semi Supervised Learning in real life.	[1M]
c)	Define Fixed Weight Competitive Net.	[1M]
d)	What is meant by Adaptive Resonance Theory (ART)?	[1M]
e)	What is the main purpose of the output layer in a feed-forward network?	[1M]
f)	State the purpose of the gradient descent algorithm.	[1M]
g)	What is meant by parameter norm penalty?	[1M]
h)	Why is data augmentation used during training?	[1M]
i)	What is the advantage of Adam optimizer?	[1M]
j)	List the names of second-order methods.	[1M]

PART-B **(50 Marks)**

2.	Explain how Supervised Learning Networks differ from Unsupervised Learning Networks in Artificial Neural Networks (ANN) and basic models of ANN.	[10M]
	OR	
3.	Describe the architecture and working principle of a Bidirectional Associative Memory (BAM) network.	[10M]
4.	Discuss the architecture and working principle of a Maxnet with the help of a neat diagram.	[10M]
	OR	
5.	Explain the structure and functioning of a Kohonen Self-Organizing Feature Map and discuss the applications of Deep Learning.	[10M]
6.	Demonstrate how Gradient-Based Learning is applied in neural networks and explain the use of gradient descent in training them.	[10M]
	OR	
7.	Analyze the role of Hidden Units and Hidden Layers in enhancing the performance of deep learning models and backpropagation algorithm.	[10M]
8.	Apply your understanding to explain Parameter Norm Penalties and demonstrate how L1 and L2 regularizations function with suitable examples.	[10M]
	OR	
9.	Demonstrate your understanding by writing short notes on:	
a)	Tangent Distance and Tangent Propagation	[5M]
b)	Manifold Learning	[5M]
10.	Explain various optimization strategies and meta-algorithms used for efficient model training.	[10M]
	OR	
11.	Describe the role of optimization in Computer Vision, Speech Recognition, and Natural Language Processing with suitable examples.	[10M]

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