Name: **Enrolment No:**	

UPES

End Semester Examination, December 2024

Course: Deep Learning **Semester : I Semester**

Program: MTech **Time : 03 hrs.**

Course Code: CSAI7020_4 **Max. Marks: 100**

Instructions:

SECTION A

Attempt **FIVE** questions

S. No.		Marks	CO
Q 1	Describe the McCulloch-Pitts neuron model and its significance in neural networks.	**4**	**CO1**
Q 2	Explain the difference between parameters and hyperparameters in deep learning.	**4**	**CO2**
Q 3	Describe the process of backpropagation in neural networks.	**4**	**CO3**
Q 4	What are feedforward neural networks, and how do they differ from recurrent neural networks?	**4**	**CO1**
Q 5	Describe the significance of ReLU (Rectified Linear Unit) in neural network activation.	**4**	**CO1**
Q 6	Explain the use of convolutional neural networks (CNNs) in image processing.	**4**	**CO3**

SECTION B

Attempt **THREE** questions

Q 7	Describe the purpose of transfer functions in neural networks.	**10**	**CO4**
Q 8	Discuss the role of deep learning in image segmentation.	**10**	**CO4**
Q 9	Explain how data normalization impacts model accuracy and training.	**10**	**CO3**
Q 10	Describe the use of RNNs in sequence modeling tasks.	**10**	**CO4**
Q 11	Explain the purpose and working of a Generative Adversarial Network (GAN).	**10**	**CO5**

SECTION-C

Attempt **TWO** questions

Q 12	a. Discuss the challenges of training deep neural networks and solutions to overcome them.	**20**	**CO5**

	b. Consider an image classification project for medical diagnosis. Describe the deep learning pipeline you would design, including data preprocessing, model selection, and evaluation metrics.		
Q 13	Analyze the use of deep learning in autonomous vehicles. Discuss how CNNs and RNNs can be integrated for tasks such as object detection and sequence prediction.	**20**	**CO5**
Q 14	a. For a customer behavior analysis system, outline the deep learning model you would use to predict future purchases. Discuss data requirements and model architecture. b. Solve a gradient descent problem with a provided cost function. Calculate a few iterations manually to demonstrate how gradient descent minimizes the cost.	**20**	**CO5**