Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 10- 12- 2025 **Time:** 1.00pm to 04.00pm

School: SOIS	**Program:** BCA-Data Science	
Course Code: CSA3071	**Course Name:** Deep Learning	
Semester: V	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	26	26	26	22	NA

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. **10Q x 2M=20M**

1.	What is Deep Learning?	**2 Marks**	**L1**	**CO1**
2.	What is the role of the learning rate (α) in gradient descent?	**2 Marks**	**L2**	**CO1**
3.	Compare between Machine Learning and Deep Learning.	**2 Marks**	**L2**	**CO1**
4.	Define Convolutional Neural Network (CNN).	**2 Marks**	**L1**	**CO2**
5.	Explain padding and why is it used in CNN?	**2 Marks**	**L1**	**CO2**
6.	Contrast between max pooling and average pooling.	**2 Marks**	**L2**	**CO2**
7.	Identify the main components of an LSTM network?	**2 Marks**	**L3**	**CO3**
8.	Explain bidirectional RNN.	**2 Marks**	**L2**	**CO3**
9.	Summarize the difference between undercomplete and overcomplete autoencoders.	**2 Marks**	**L2**	**CO3**
10.	Why do deep learning models require large amounts of data?	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Explain the process of optimizing a logistic regression classifier using gradient descent and its variants (batch, mini-batch, stochastic, momentum, and AdaGrad) with suitable diagrams.	**20 Marks**	**L3**	**CO1**
		Or			
12.	**a.**	Outline the limitations of traditional machine learning and how deep learning overcomes them, with suitable real-life examples.	**20 Marks**	**L2**	**CO1**

13.	**a.**	Explain the architecture of a Convolutional Neural Network (CNN) with a neat diagram and label each layer. Describe how feature extraction happens.	**20 Marks**	**L2**	**CO2**
		Or			
14.	**a.**	Summarize convolution and pooling operations with examples and explain their roles in feature extraction and dimensionality reduction in CNNs.	**20 Marks**	**L2**	**CO2**

15.	**a.**	Develop the architecture and working of a Recurrent Neural Network (RNN). Compare it with Feedforward Networks.	**20 Marks**	**L3**	**CO3**
		Or			
16.	**a.**	Build the structure and operation of an LSTM network with gates and equations. Explain in detail how it solves the vanishing gradient problem.	**20 Marks**	**L3**	**CO3**

17.	**a.**	Explain the architecture and working of the undercomplete and denoising autoencoders with neat diagrams. Discuss one application of each.	**20 Marks**	**L2**	**CO4**
		Or			
18.	**a.**	Outline the representational power and architecture of autoencoders. Discuss the effect of layer size and depth on performance.	**20 Marks**	**L2**	**CO4**