PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 21-05-2025   **Time:** 01:00 pm – 04:00 pm

School: SOIS	**Program:** MCA
Course Code: CSA4041	**Course Name:** Deep Learning
Semester: IV	**Max Marks**: 100 **Weightage**: 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	24.4	24.4	25.6	25.6	-

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.	In deep learning models, how do L1 and L2 regularization techniques help prevent overfitting during training?	2 Marks	L2	CO1
2.	Express the code of optimizer in deep learning.	2 Marks	L1	CO1
3.	List the different types of pooling in CNN.	2 Marks	L1	CO2
4.	Define the role of strides introduced in CNN.	2 Marks	L1	CO2
5.	Define RNN with suitable diagram.	2 Marks	L1	CO3
6.	Write the python code of bidirectional RNN.	2 Marks	L2	CO3
7.	How denoising autoencoder different from undercomplete autoencoder?	2 Marks	L2	CO4
8.	Write the Python code to train an autoencoder model using the fit() function.	2 Marks	L2	CO4
9.	What is GRU?	2 Marks	L1	CO3
10.	Distinguish between encoder and decoder.	2 Marks	L2	CO4

Part B

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

11.	**a.**	Illustrate about hyperparameter tuning in deep learning.	10 Marks	L2	CO1

	b.	Implement logistic regression using gradient descent to classify datasets.	10 Marks	L3	CO1
		Or			
12.	a.	Explain in detail about logistic classifier using various types of gradient descent.	10 Marks	L2	CO1
	b.	Develop a feed-forward neural network to solve regression problems.	10 Marks	L3	CO1
13.	a.	Consider a CNN model which contains 8 layers namely input, convolution, ReLU, pooling, flattening, dropout, fully connected and output layer. The input layer takes input as 2D image. Processing is performed from convolution to fully connected layer. Finally, the output layer will predict the output. Take a black and white image of some character and number 5 x 5 pixel as input. Perform convolution using 3 different features 3 x 3 pixel, pooling 2 x 2 pixel of average, flatten the pooling output, dropout of 15% connection in the fully connected layer. The actual output of the output layer is 1 when the image is a character, 0 otherwise. Determine the computation of every layer and output.	10 Marks	L3	CO2
	b.	Employ a python code to classify a two-dimensional image data using CNN.	10 Marks	L3	CO2
		Or			
14.	a.	Discuss in detail about 8 types of layers in CNN using suitable sketch.	10 Marks	L2	CO2
	b.	Design and implement a Convolutional Neural Network (CNN) model for sentiment analysis using a text dataset, such as movie reviews or tweets.	10 Marks	L3	CO2
15.	a.	How LSTM is working? Demonstrate with neat sketch.	10 Marks	L2	CO3
	b.	Implement a basic RNN for image classification tasks.	10 Marks	L3	CO3
		Or			
16.	a.	Deliberate encoder-decoder architecture for machine translation.	10 Marks	L2	CO3
	b.	Apply bidirectional RNN to classify sequential data.	10 Marks	L3	CO3
17.	a.	Explain the different components of a regularized autoencoder, and illustrate its architecture with a diagram.	10 Marks	L2	CO4
	b.	Design and implement an autoencoder model for reducing the dimensionality of data.	10 Marks	L3	CO4
		Or			
18.	a.	Discuss in detail about sparse autoencoder with neat sketch.	10 Marks	L2	CO4
	b.	Apply an Encoder-Decoder LSTM model using Keras to translate short sequences from English to a synthetic language (e.g., reversing the words or converting vowels to numbers).	10 Marks	L3	CO4