Roll No: | | | | | | | | | | | |

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
Approved by AICTE, New Delhi | Approved By BCI
Bengaluru

Mid Term Examinations - October 2026

Date: 08/10/2026 **Time:** 02:00 PM - 03:30 PM

Course Code: CSA4709 **Course Name:** Deep Learning

Semester: Third Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	66	24

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	State the fundamental purpose of the loss function in train ing a supervised feedforward neural network.	2	CO1	BT1
2	Differentiate between standard Gradient Descent and Stochastic Gradient Descent (SGD) in terms of weight up dates.	2	CO1	BT2
3	Define Pooling with respect to CNN.	2	CO2	BT1
4	List any 2 Deep Learning architectures.	2	CO1	BT1
5	List two specific applications of Convolutional Neural Net works in natural language processing (text classification).	2	CO2	BT1

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Differentiate between Gradient Descent and Stochastic Gradient Descent with suitable examples.	10	CO1	BT2
7	Describe the architecture of a deep Feedforward Neural Network. Discuss the flow of data during the forward propagation and backpropagation phases.	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Write a Python code snippet using Keras to build, compile, and train a deep feedforward neural net work utilizing dropout layers for regularization. Assume preprocessing is completed.	10	CO1	BT3
9	Use python packages and libraries to perform the following tasks on house-prices dataset: Import necessary packages Load Dataset Define MLP Model Compile Model Evaluate the model	10	CO1	BT3

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT

10	An input image has dimensions 5×5. Input $I = \begin{bmatrix} 0 & 1 & 1 & 0 & 2 \\ 2 & 2 & 0 & 1 & 1 \\ 1 & 0 & 1 & 2 & 0 \\ 0 & 1 & 2 & 1 & 1 \\ 1 & 2 & 0 & 0 & 1 \end{bmatrix}$ Filter $F = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ Calculate the output matrix after applying the convolution operation with a Stride of 1 and Padding of 1 (zero-padding the borders of the original image first). Show the calculation for the first row of the padded input.	10	CO2	BT3
11	Perform a convolution operation on a 4×4 input image using a 3×3 vertical edge filter. Input $I = \begin{bmatrix} 3 & 1 & 2 & 1 \\ 0 & 2 & 1 & 3 \\ 1 & 1 & 0 & 2 \\ 2 & 0 & 1 & 1 \end{bmatrix}$ Filter $F = \begin{bmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{bmatrix}$ Calculate the resulting feature map assuming Stride $= 1$ and Padding $= 0$. Show all intermediate multiplication and summation steps.	10	CO2	BT3

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	Build a simple neural network with: Two input neurons x1=2, x2=4 One hidden neuron with weight w1=0.2 and w2=0.3 One output neuron with weight w3=0.4 Mean Squared Error (MSE) loss function Sigmoid activation function for the hidden and output layer Take learning rate=0.01, b1 & b2=0.5 Update the weight w3 and bias b2 for one iteration.	10	CO1	BT3
13	Build a simple neural network with: Two input neurons x1=1, x2=4 One hidden neuron with weight w1=0.1 and w2=0.2 One output neuron with weight w3=0.3 Mean Squared Error (MSE) loss function Sigmoid activation function for the hidden and output layer Take learning rate=0.05, b1 & b2=0.5 Update the weight w3 and bias b2 for one iteration.	10	CO1	BT3