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PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – May/June 2026

Date: 18-05-2026

Time: 01:00pm – 04:00pm

School: SOE	Program: B.Tech	
Course Code : ECE3026	Course Name: Neural Networks and Deep Learning	
Semester: VI	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05	C06
Marks	4	10	19	24	24	19

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.	Define neural networks and state their motivation.	2 Marks	L2	C01
2.	Identify one limitation of traditional computing approaches.	2 Marks	L2	C01
3.	State the role of stochastic gradient descent.	2 Marks	L2	C03
4.	What is meant by curse of dimensionality?	2 Marks	L2	C03
5.	Define convolution operation in CNN.	2 Marks	L2	C04
6.	What is a feature map?	2 Marks	L2	C04
7.	What is pooling in CNN?	2 Marks	L2	C05
8.	What is meant by sequential data?	2 Marks	L2	C05
9.	Define reinforcement learning.	2 Marks	L2	C06
10.	What is overfitting in deep learning?	2 Marks	L2	C06

Part B

Answer the Questions.

Total Marks 80M

11.	a.	A startup is developing a classification system but struggles to understand how inputs are transformed into outputs. Explain how an artificial neuron processes inputs and how this extends to a feedforward neural network.	10 Marks	L3	C02
Or					
12.	a.	A development team is implementing a neural network using TensorFlow but faces challenges in structuring computations. Explain how tensors, variables, and computational graphs work together to enable model execution.	10 Marks	L3	C02
13.	a.	During training, a neural network exhibits unstable convergence and fluctuating loss values. Explain how the learning rate and stochastic gradient descent influence convergence and suggest improvements.	15 Marks	L3	C03
Or					
14.	a.	A high-dimensional dataset results in poor model performance. Explain how dimensionality affects learning and discuss methods to handle such challenges.	15 Marks	L3	C03
15.	a.	While training deep networks, gradients diminish significantly in earlier layers. Explain the reasons behind this issue and the techniques used to address it.	15 Marks	L3	C06
Or					
16.	a.	A trained model performs well on the training data but poorly on unseen data. Identify the causes and propose suitable techniques to improve generalization.	15 Marks	L3	C06
17.	a.	A computer vision system must recognize objects under varying conditions. Explain how convolution, activation, and pooling operations enable convolutional neural networks to extract meaningful spatial features.	20 Marks	L3	C04
Or					
18.	a.	In designing an image classification model, engineers must understand how filters contribute to feature extraction. Explain how convolution and pooling help build hierarchical representations.	20 Marks	L3	C04
19.	a.	A developer must choose appropriate models for image recognition and speech processing. Explain CNN and RNN architectures and justify their suitability for each task.	20 Marks	L3	C05
Or					
20.	a.	A CNN model achieves high accuracy but requires significant computation. Explain how architectural depth and optimization strategies influence performance and efficiency.	20 Marks	L3	C05