



PRESIDENCY UNIVERSITY

BENGALURU

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End - Term Examinations – May/June 2026

Date: 14 – 05- 2026

Time: 01:00pm – 04:00pm

School: SOE	Program: B. Tech (EEE)	
Course Code: EEE3009	Course Name: AI Applications for Electrical Engineering	
Semester: VI	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	2	14	24	32	28

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.	Classify the five distinct research areas of AI.	2 Marks	L2	C01
2.	Explain the concept of Least Mean Squares Algorithm (LMS)?	2 Marks	L2	C02
3.	Explain about the Self-Organizing Map (SOM).	2 Marks	L2	C02
4.	Show any two basic operations on fuzzy sets.	2 Marks	L2	C03
5.	Outline the concept of Principal Component Analysis (PCA).	2 Marks	L2	C03
6.	Explain the meaning of Fuzzy Cartesian Product.	2 Marks	L2	C04
7.	Explain the concept of encoding in a Genetic Algorithm.	2 Marks	L2	C05
8.	Describe the role of the fitness function in genetic algorithms.	2 Marks	L2	C05
9.	Explain the purpose of reproduction operators in genetic algorithms.	2 Marks	L2	C05
10.	Discuss the basic concept of Artificial Neural Networks (ANN).	2 Marks	L2	C05

Part B

Answer the Questions.

Total Marks 80M

11.	a.	Apply the Backpropagation Algorithm to update the weights of a Multilayer Perceptron for a given training example.	10 Marks	L3	C02
	b.	Illustrate the basic operations and properties of fuzzy sets with examples.	10 Marks	L3	C03
Or					
12.	a.	Apply neural network learning methods to train a model for pattern classification.	10 Marks	L3	C02
	b.	Show the architecture and working of an Autoencoder used in neural networks.	10 Marks	L3	C03
13.	a.	Examine the membership functions in fuzzy sets and explain different types of membership functions with suitable diagrams.	10 Marks	L3	C03
	b.	Discuss the applications of fuzzy logic and deep learning techniques in engineering systems.	10 Marks	L3	C04
Or					
14.	a.	Illustrate the concept of Fuzzy Logic and differentiate between Fuzzy Set and Crisp Set with examples.	10 Marks	L3	C03
	b.	Use the structure and working principle of Long Short-Term Memory (LSTM) units in recurrent neural networks.	10 Marks	L3	C04
15.	a.	In an electric vehicle battery management system, sensor readings such as temperature and voltage are imprecise. Simplify the fuzzy inference model using Fuzzy Relation and fuzzy rules to determine the battery health condition.	20 Marks	L4	C04
Or					
16.	a.	A power distribution company collects large amounts of voltage, current, and power data from different substations. Analyse the Principal Component Analysis can be applied to reduce the dimensionality of the data and identify the most important electrical parameters.	20 Marks	L4	C04
17.	a.	A distribution engineer is evaluating the performance of the IEEE 33-bus distribution system to minimize real power losses and improve voltage profile. Evaluate the effectiveness of applying a Genetic Algorithm for optimal placement and sizing of distributed generation units in the network. Consider different cases such as: • Base case without distributed generation • Single distributed generation placement • Multiple distributed generation placement Network reconfiguration .	20 Marks	L5	C05
Or					
18.	a.	In a power transformer condition monitoring system, thousands of sensor signals are collected daily. Evaluate an Auto encoder can be used to extract important features and detect abnormal operating conditions.	20 Marks	L5	C05