

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Regular/Supplementary Examinations OCT/NOV 2025
DEEP LEARNING TECHNIQUES

(OPEN ELECTIVE)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions. **ONE** Question from **Each unit**
All Questions Carry Equal Marks

UNIT-I

1. a) Discuss the evolution from probabilistic modeling to modern neural network approaches in machine learning. Highlight key strengths and weaknesses of each approach. [7M]
b) What are the four branches of machine learning? Compare their learning paradigms and provide examples of real-world applications for each. [7M]
(OR)
2. a) Define overfitting and under fitting in the context of machine learning. How can these issues be detected and addressed during model development? [7M]
b) Why is cross-validation important in assessing the performance of machine learning models, and how does it help prevent overfitting? [7M]

UNIT-II

3. a) Discuss the evolution of natural language understanding from rule-based methods to deep learning models. What are the key breakthroughs in language processing using neural networks? [7M]
b) Describe the structure and working of an Artificial Neural Network [7M]
(OR)
4. a) Explain the concept of backpropagation and its role in training deep neural networks. [7M]
b) Compare shallow and deep architectures in neural networks with suitable examples. [7M]

UNIT-III

5. a) Discuss how binary classification is implemented for classifying movie reviews using Keras. [7M]
b) Explain how loss functions and optimizers affect model training. [7M]
(OR)
6. a) Discuss the importance of data preprocessing in building neural networks. [7M]
b) Explain multiclass classification using the example of classifying newswires. [7M]

UNIT-IV

7. a) Explain multichannel convolution operation and its significance in image processing. [7M]
b) Compare CNN and RNN models in terms of architecture and use cases. [7M]
(OR)
8. a) Describe the process of implementing a CNN using PyTorch. [7M]
b) Discuss how CNNs are used for image classification tasks. [7M]

UNIT-V

9. a) Explain the architecture and working of Generative Adversarial Networks (GANs). [7M]
b) Describe the concept of Deep Reinforcement Learning and its applications. [7M]
(OR)
10. a) Explain the difference between supervised and unsupervised deep learning models with examples. [7M]
b) Illustrate the structure and function of Auto encoders. [7M]
