Code No: 21P61601   SR21   Set: 1

III B. Tech II Sem Regular Examinations, May-2025

DEEP LEARNING

Artificial Intelligence and Machine Learning

Time: 3Hours   Max. Marks:70

*Answer Any **FIVE** Questions, Choosing **ONE** Question from each UNIT*

All Questions carry EQUAL marks

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UNIT-I

1   a) Describe the structure and learning process of Early Neural Networks like Perceptrons.

[7M]

7.   b) What are the four main branches of Machine Learning? Give one application of each.

[7M]

(Or)

2   a) Compare and contrast Decision Trees, Random Forests, and Gradient Boosting

Machines with examples.   [7M]

b) What are the four main branches of Machine Learning? Give one application of each.

[7M]

UNIT-II

3   a) Define Deep Learning. How is it inspired by the biological neural networks of the human

brain?   [7M]

b) Define Deep Learning. How is it inspired by the biological neural networks of the

human brain? [7M]

(Or)

4   a) What is an Artificial Neural Network (ANN)? Describe its structure with a neat diagram

[7M]

b) List and explain the common challenges in training deep networks.   [7M]

UNIT-III

5   a) Describe the different layers used in a neural network. Give examples of each. [7M]

b) Write short notes on the role of activation functions in neural networks.   [7M]

<div align="center">(Or)</div>

6   a) Compare Keras, TensorFlow, Theano, and CNTK in terms of usability and performance.

<div align="right">[7M]</div>

   b) What is binary classification? Explain with the example of movie review sentiment analysis   [7M]

<div align="center">**UNIT-IV**</div>

  a) Define Convolutional Neural Networks. List the main components and their functions in a CNN architecture.   [7M]

   b) Explain how representation learning works in CNNs. Why is it important in deep learning tasks?   [7M]

<div align="center">(Or)</div>

8   a) What is multichannel convolution? Describe with an example how convolution operation works on RGB images.   [7M]

   b) Define Recurrent Neural Networks. How do they differ from Feedforward Neural Networks?   [7M]

<div align="center">**UNIT-V**</div>

9   a) What is an Autoencoder? Explain its architecture and how it is used for dimensionality reduction.   [7M]

   b) Compare and contrast Autoencoders, RBMs, and DBNs in terms of structure, learning strategy, and use cases.   [7M]

<div align="center">(Or)</div>

10 a) Describe the workflow of a Natural Language Processing (NLP) system using deep learning. What are the key components involved?   [7M]

   b) What are Generative Adversarial Networks (GANs)? Explain their architecture with a neat diagram and real-world applications.   [7M]