CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
IV–B.TECH–I–Semester End Examinations (Regular) - December- 2025
DEEP LEARNING
(CSM)

[Time: 3 Hours]   **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 10 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A   **(10 Marks)**

1. a) Give one example for each of supervised and unsupervised learning algorithms.   [1M]
   b) What is feature engineering?   [1M]
   c) How can norm penalties be interpreted as a constrained optimization problem?   [1M]
   d) Name one common parameter initialization strategy.   [1M]
   e) Give one real-world example where convolution is used in deep learning.   [1M]
   f) How can unsupervised learning be used to learn convolutional features?   [1M]
   g) What is meant by "unfolding" a recurrent neural network in time?   [1M]
   h) What is explicit memory in neural networks?   [1M]
   i) Why is it important to compare a new model against a baseline?   [1M]
   j) Give one example of deep learning applied in recommendation systems.   [1M]

PART-B   **(50 Marks)**

2. Describe k-Nearest Neighbors (k-NN) algorithm and its applications in supervised learning.   [10M]

OR

3. Explain backpropagation algorithm for training a neural network.   [10M]

4. Explain how early stopping can prevent overfitting and improve generalization with a training graph.   [10M]

OR

5. Discuss the importance of parameter initialization and describe common initialization strategies.   [10M]

6. Discuss the implications of this prior on model design and generalization performance in image recognition tasks.   [10M]

OR

7. Explain methods for efficient computation of convolutions in deep learning.   [10M]

8. Discuss applications such as machine translation and speech recognition, and explain how variable-length input and output sequences are handled.   [10M]

OR

9. Explain the architecture of an LSTM cell with a diagram.   [10M]

10. Discuss one method for systematically identifying and fixing problems in a neural network's training process (practical methodology).   [10M]

OR

11. Explain how deep learning is applied to speech recognition. Include examples of architectures such as RNNs, LSTMs, or Transformer-based models.   [10M]

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