

Register No : \_\_\_\_\_

**THE KAVERY ENGINEERING COLLEGE**  
(An Autonomous Institution)

**B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025**

*Fifth Semester*

*Artificial Intelligence and Data Science*

**AD3501 - Deep Learning**

*Regulations - 2021*

*Duration : 3 Hrs*

*Maximum : 100 Marks*

**PART - A (ANSWER ALL QUESTIONS) (Marks 10\*2=20)**

| <i>Q.No</i> | <i>Questions</i>                                            | <i>BTL</i> | <i>CO</i> | <i>Marks</i> |
|-------------|-------------------------------------------------------------|------------|-----------|--------------|
| 1.          | What is gradient-based optimization?                        | L1         | 1         | 2            |
| 2.          | Define bias and variance.                                   | L1         | 1         | 2            |
| 3.          | Outline the concept of pooling in CNN.                      | L2         | 2         | 2            |
| 4.          | What is receptive field?                                    | L1         | 2         | 2            |
| 5.          | Differentiate between unidirectional and bidirectional RNN. | L2         | 3         | 2            |
| 6.          | What is sequence-to-sequence model?                         | L1         | 3         | 2            |
| 7.          | Infer hyperparameter tuning.                                | L2         | 4         | 2            |
| 8.          | Define ROC curve.                                           | L1         | 4         | 2            |
| 9.          | What is an autoencoder?                                     | L1         | 5         | 2            |
| 10.         | Mention two applications of variational autoencoders.       | L2         | 5         | 2            |

**PART - B (ANSWER ALL QUESTIONS) (Marks 5\*16 = 80)**

| <i>Q.No</i> | <i>Questions</i>                                                                                       | <i>BLT</i> | <i>CO</i> | <i>Marks</i> |
|-------------|--------------------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 11.         | a Explain capacity, overfitting and underfitting in deep learning models with suitable examples.<br>Or | L2         | 1         | 16           |
|             | b What are regularization techniques? Discuss with examples.                                           | L3         | 1         | 16           |
| 12.         | a Illustrate the different types of convolution variants with examples.<br>Or                          | L3         | 2         | 16           |
|             | b With an example explain the loss functions for regression in detail.                                 | L3         | 2         | 16           |

|     |   |                                                                      |    |   |    |
|-----|---|----------------------------------------------------------------------|----|---|----|
| 13. | a | Discuss problems of vanishing and exploding gradients in RNN.        | L2 | 3 | 16 |
|     |   | Or                                                                   |    |   |    |
|     | b | What is the gated architecture of LSTM? Explain in detail.           | L2 | 3 | 16 |
| 14. | a | Explain hyperparameter tuning process in detail.                     | L2 | 4 | 16 |
|     |   | Or                                                                   |    |   |    |
|     | b | Write about debugging strategies in deep learning models.            | L2 | 4 | 16 |
| 15. | a | Discuss different types of regularized autoencoders with an example. | L2 | 5 | 16 |
|     |   | Or                                                                   |    |   |    |
|     | b | What are deep generative models? Explain with applications.          | L2 | 5 | 16 |