

**THE KAVERY ENGINEERING COLLEGE***(An Autonomous Institution)***B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 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)**

| <b>Q.No</b> | <b>Questions</b>                                                 | <b>BLT</b> | <b>CO</b> | <b>Marks</b> |
|-------------|------------------------------------------------------------------|------------|-----------|--------------|
| 1.          | What is Deep Learning?                                           | L1         | 1         | 2            |
| 2.          | List the properties that probability density function satisfies? | L4         | 1         | 2            |
| 3.          | Define feedforward and Backpropagation.                          | L1         | 2         | 2            |
| 4.          | Outline the problem arise due to convolution.                    | L2         | 2         | 2            |
| 5.          | What are the applications of RNN?                                | L1         | 3         | 2            |
| 6.          | What is LSTM? How it differs from RNN?                           | L1         | 3         | 2            |
| 7.          | Define Confusion Matrix.                                         | L1         | 4         | 2            |
| 8.          | Give the types of baseline models.                               | L2         | 4         | 2            |
| 9.          | Define Generative Adversarial Networks.                          | L1         | 5         | 2            |
| 10.         | Define Autoencoders?                                             | L1         | 5         | 2            |

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

| <b>Q.No</b> | <b>Questions</b>                                                                                                                         | <b>BLT</b> | <b>CO</b> | <b>Marks</b> |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|--------------|
| 11.         | a i Discuss the Bias-Variance trade off.                                                                                                 | L1         | 1         | 8            |
|             | i Discuss overfitting and underfitting with an example.                                                                                  | L2         | 1         | 8            |
|             | <b>Or</b>                                                                                                                                |            |           |              |
|             | b Extrapolate conditional probability and develop a summary of various common probability distributions.                                 | L1         | 1         | 16           |
| 12.         | a Develop table with examples of different formats of data that can be used with convolutional networks                                  | L2         | 2         | 16           |
|             | <b>Or</b>                                                                                                                                |            |           |              |
|             | b How to introduce non-linearity in a convolutional neural network? Explain with an example.                                             | L2         | 2         | 16           |
| 13.         | a What is bi-directional recurrent neural network? Explain the architecture of a bi-directional recurrent neural network with a diagram. | L2         | 3         | 16           |

|     |   |                                                                                                                                              |    |   |    |
|-----|---|----------------------------------------------------------------------------------------------------------------------------------------------|----|---|----|
|     | b | What is long short-term memory? Compare and contrast LSTM and gated recurrent units.                                                         | L2 | 3 | 16 |
| 14. | a | Discuss the various performance metrics to evaluate a deep learning model with an example.                                                   | L3 | 4 | 16 |
|     |   | <b>Or</b>                                                                                                                                    |    |   |    |
|     | b | What are hyperparameters? Discuss the steps to perform hyperparameter tuning.                                                                | L3 | 4 | 16 |
| 15. | a | Justify your current answer, that how autoencoders are suitable compared to Principal Component Analysis (PCA) for dimensionality reduction. | L4 | 5 | 16 |
|     |   | <b>Or</b>                                                                                                                                    |    |   |    |
|     | b | What is a generative adversarial network? Explain the architecture of a generative adversarial network with a diagram.                       | L4 | 5 | 16 |