

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (R,S) Examination November 2025 (2019 Scheme)

Course Code: AIT401**Course Name: FOUNDATIONS OF DEEP LEARNING****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

- | | | |
|----|--|-----|
| 1 | Discuss Perceptron training rule. | (3) |
| 2 | Explain Hyperbolic Tangent Activation Function. | (3) |
| 3 | Discuss any 3 practical applications of Neural Networks. | (3) |
| 4 | Give the drawbacks of rectified linear units. | (3) |
| 5 | Point out different set of layers in Feedforward networks. | (3) |
| 6 | Describe gradient descent. | (3) |
| 7 | Explain the measures to prevent overfitting. | (3) |
| 8 | List three stages of a convolutional network. | (3) |
| 9 | Describe the methods to make an RNN deep. | (3) |
| 10 | Describe autoencoders. | (3) |

PART B*Answer any one full question from each module, each carries 14 marks.***Module I**

- | | | |
|----|---|-----|
| 11 | a) Explain softmax, LeakyRelu, and HardTanh activation functions. | (7) |
| | b) Explain types of Regression Loss Functions. | (7) |

OR

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|----|---|------|
| 12 | a) The following figures shows a multilayer feed-forward neural network. The initial weight and bias values of the network is | (10) |
|----|---|------|

given in the table below. The activation function used is the sigmoid function. Let the learning rate be 0.92.

X	X	X	W ₁	W ₁	W ₂	W ₂	W ₃	W ₃	W ₄	W ₅	b ₄	b ₅	b ₆
1	2	3	4	5	4	5	4	5	6	6			
0	1	1	0.1	0.3	-0	0.2	0.6	-0	0.2	0.2	0.	0.	0.
											3	1	1

Calculate weight and bias updation with the first training sample (X_1, X_2, X_3) with class label 1, using backpropagation algorithm.

- b) What is Bias and Variance? (4)

Module II

- 13 a) Explain Vanishing Gradient and Exploding Gradient Problem. (7)
b) Explain SGD with momentum. (7)

OR

- 14 a) Explain different ensemble methods. (7)
b) Compare Dropout with Early Stopping. (7)

Module III

- 15 a) Illustrate the practical use cases of CNN by discussing the workflow of a specific application. (10)
b) **Construct** a convolutional network to demonstrate the effect of zero padding on network size. (4)

OR

- 16 a) Distinguish between MaxPooling and AveragePooling with suitable (6)

diagram.

- b) Explain the architecture of pretrained CNN Models. (8)

Module IV

- 17 a) Explain types of RNN. (6)

- b) Distinguish between Bi-directional RNN and LSTM. (8)

OR

- 18 a) Explain Gated Recurrent Unit. (10)

- b) Explain BERT. (4)

Module V

- 19 a) Explain types of GAN. (10)

- b) Give examples of GAN. (4)

OR

- 20 a) How does a restricted Boltzman machine work. (9)

- b) Explain the architecture of Deep Belief Networks. (5)
