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

12	a)	The following figures hows 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_1	X_2	X_3	W_{14}	W_{15}	W_{24}	W_{25}	W_{34}	W_{35}	W_{46}	W_{56}	b_4	b_5	b_6
0	1	1	0.1	0.3	-0	0.2	0.6	-0	0.2	0.2	0.3	0.1	0.1

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)

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