Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech (Hons.) Degree Examination December 2024 (2022 Admission)

Course Code: CST 395

Course Name: NEURAL NETWORKS AND DEEP LEARNING

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks) Marks

1	Explain in detail about reinforcement learning.	3
2	Explain about validation and its connection with hyperparameter tuning.	3
3	Explain about the vanishing gradient problem and how it can be avoided.	3
4	Discuss about the use of activation function in neural network. List out any three activation functions.	3
5	Give the importance of learning rate in gradient descent algorithm	3
6	What is the importance of data augmentation in deep learning networks? List some techniques used for data augmentation for image data.	3
7	Give the importance of optimization in deep learning, List out at least three concepts used for optimization.	3
8	Discuss with suitable example the working of convolution operation in CNN.	3
9	Explain the application of LSTM.	3
10	Discuss the working of Gated Recurrent Unit.	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	a)	Explain the importance of performance measures in evaluation of the machine learning algorithm.	4

b) Predict the price of a 1300 square feet house using the regression model generated from the following data. 10

No.	Square feet	Price (Lakhs)
1	500	5
2	900	10
3	1200	13
4	1500	18
5	2000	25
6	2500	32
7	2700	35

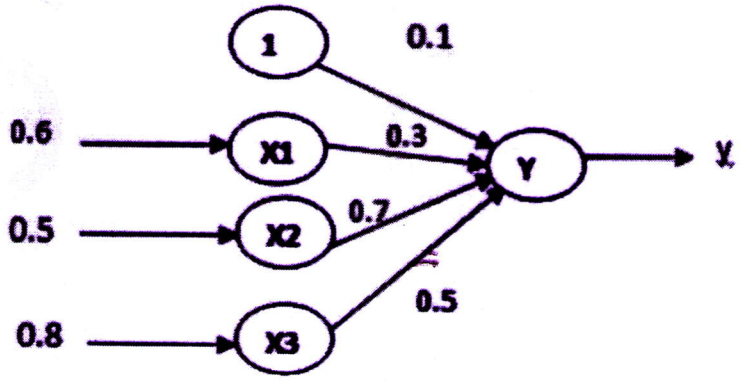
12 a) Compare Linear Regression with Logistic regression. 4

b) Suppose 10000 patients get tested for flu; out of them, 9000 are actually healthy and 1000 are actually sick. For the sick people, a test was positive for 620 and negative for 380. For healthy people, the same test was positive for 180 and negative for 8820. Construct a confusion matrix for the data and compute the accuracy, precision and recall, specificity, FPR, F1 score for the data. 10

Module -2

13 a) Explain in detail back propagation algorithm with suitable example. 4

b) Calculate the output of the following neuron Y with the activation function as a) binary sigmoid b) tanh c)ReLU. 10



14 a) Explain in detail about the structure of multi-layer perceptron. 7

b) Discuss in detail, various loss functions used in machine learning. 7

Module -3

15	a)	Explain in detail any three Ensemble methods.	7
	b)	What is meant by Drop out in deep learning network? Explain how drop out works.	7
16	a)	Explain in detail any three parameter initialization methods.	7
	b)	Discuss in detail any three variants of gradient descent.	7

Module -4

17		Explain in detail about the structure and working of CNN with diagrams.	14
18		Explain in detail about various types of pooling layer with example.	14

Module -5

19		Explain the architecture and working of LSTM.	14
20		Compare RNN with CNN. Illustrate the workings of the RNN with an example of a single sequence defined on a vocabulary of four words.	14

*****