Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023

Semester : Semester IV - 2021
Course Code : CSE3016
Course Name : Sem IV - CSE3016 - Neural Network and Fuzzy Logic
Program : CAI,CEI&CST

Date : 17-APR-2023
Time : 2PM - 3.30PM
Max Marks : 50
Weightage : 25%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS **(5 X 2 = 10M)**

1. Explain how a Leaky ReLU function solves the disadvantage of a ReLU function.
(CO1) [Knowledge]

2. Differentiate between single layer neural network and multilayer neural network.
(CO1) [Knowledge]

3. State activation function.
(CO1) [Knowledge]

4. Explain in brief the computations each hidden or output neuron of a multilayer perceptron performs.
(CO1) [Knowledge]

5. What are the disadvantages of Linear Activation Function.
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **(4 X 5 = 20M)**

6. Describe in brief the different components of a neural network architecture.
(CO1) [Comprehension]

7. Describe the different kinds of passes in different layers of neural network using Back Propagation algorithm in Multilayer Perceptron.

(CO1) [Comprehension]

8. Identify the simple building block of a neural network. Explain its different parts in brief.

(CO1) [Comprehension]

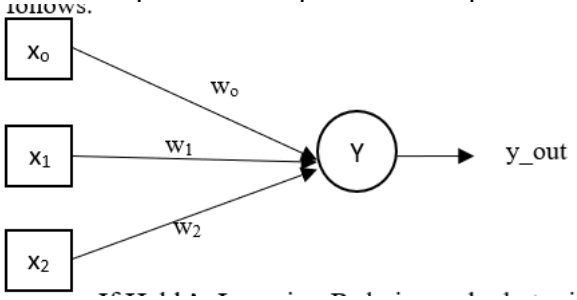
9. Explain why using a Sigmoidal activation function is beneficial instead of a Step-Binary Function. Analyse the effect on the gradient of a sigmoidal activation function when the value ranges above +3 or below -3.

(CO1,CO2) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **(2 X 10 = 20M)**

10. A computer programmer wants to design a simple neural network to realize a two input *AND* function and one output unit. A bias of 0.4 is used. The inputs and outputs are in bipolar form. The structure of the required neural net is as follows.



If Hebb's Learning Rule is used what will be the values of the weights after the completion of a single epoch. Explain the entire process in brief along with a suitable truth table(If the initial weights are taken as 0.2 each and Linear Activation Function is used taking f(x)=kx,k=1).

(CO1,CO2) [Application]

11. Consider the McCulloch-Pitts neural network shown in Fig. All the units, except those at the input level, have the activation function as given below:
What are the responses of the output unit *Z* with respect to various input combinations? We assume the inputs are binary. What logical function the whole network realizes?

(CO1,CO2) [Application]