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**Presidency University**

**Bengaluru**

 **SCHOOL OF MANAGEMENT**

 **MAKE-UP EXAMINATION – SEP 2023**

**Course Code**: ECE 295

**Course Name**: Artificial Neural Networks

**Program & Sem**: B. Tech.

**Date**:05.10.2023

**Time**: 9:30 AM – 12:30 PM

**Max Marks**: 100

**Weightage**: 50%

 **Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *x*

**Part A [Memory Recall Questions]**

**Answer all the Questions. (4Qx5M= 20M)**

1. Briefly explain the threshold and sigmoid activation functions with equations.

 (C.O. No.1) [Knowledge]

2. Draw the signal-flow graph of the nonlinear model of a neuron and describe it.

 (C.O. No.1) [Knowledge]

3. What do you mean by a single-layer feedforward networks? Explain with a diagram.

 (C.O.No.1) [Knowledge]

4. Write down the perceptron convergence algorithm. (C.O. No.1) [Knowledge]

**Part B [Thought Provoking Questions]**

**Answer all the Questions. (4Qx10M=40M)**

5. Describe the four rules of knowledge representation. (C.O. No. 1) [Knowledge]

6. Define the following types of learning processes (a) Supervised learning (b) Unsupervised learning with block diagrams. (C.O. No. 2) [Knowledge]

7. Explain the Rosenblatt’s perceptron with its signal-flow graph and equation. How can it be used for pattern-classification for two input variables? Give an example.

 (C.O. No. 2) [Comprehension]

8. Draw the signal-flow graph of a least-mean-square adaptive filter. Discuss the two important processes involved in its operation. (C.O. No. 2) [Comprehension]

**Part C [Problem Solving Questions]**

**Answer all the Questions. (2Qx20M=40M)**

9. Derive the equations for the back-propagation algorithm. (C.O. No. 3) [Application]

10. The logistic activation function can be expressed as



Here, weight vector **w**=[1,2,3,4,5 ], input vector **y**= [3,4,2,1,5], bias b==0.1, , and a=1. Find the numerical values . [Given: exp(-46.02)=1.03X10-20]

 (C.O. No. 3) [Application]