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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- Feb 2018

B.Tech VIII Semester

COURSE CODE: **13B1WEC831** MAX. MARKS:25

COURSE NAME: **SOFT COMPUTING TECHNIQUES**

COURSE CREDITS: 3 MAX. TIME: 1:30 Hr

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1 Explain briefly the biological neuron and Compare physical neuron and artificial neuron. **[CO3] [3]**

Q2. a) Distinguish between Supervised and Unsupervised Learning. **[CO3] [2+2]**

b) Explain the algorithm for learning rule of Competitive learning and Hebbs learning

Q3. A two layer network is to have four inputs and six outputs. The range of the outputs is to be continuous between 0 and 1. **[CO3] [3]**

What can you tell about the network architecture? Specifically,

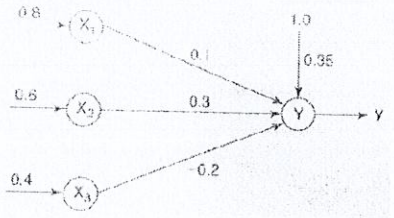
(a) How many neurons are required in each layer?

(b) What are the dimensions of the first-layer and second layer weight matrices?

(c) What kinds of transfer functions can be used in each layer?

(d) Draw a diagram showing the connectivity of the network

Q4. Obtain the output of the neuron Y for the network shown in Figure using activation functions as: (i) binary sigmoidal and (ii) bipolar sigmoidal. **[CO3] [3]**



Q5. Consider a simple perceptron model with four inputs. Let the initial weight vector be $[1\ -1\ 0.5\ 0]^T$. Set of input training vectors are $x1=[1\ -2\ \ 0\ -1]^T$, $x2=[0\ 1.5\ -0.5\ -1]^T$ and $x3=[-1\ \ 1\ \ 0.5\ \ -1]^T$ .Desired responses for these input vectors are -1, -1, and 1 respectively. The activation function is sign(x). Illustrate perceptron learning process. **[CO5] [5]**

Q6. a) Elaborate two defuzzification methods. **[CO2] [2]**

b) Using inference approach, obtain the membership values for the triangular shapes **[CO5] [3]**

(I=Isosceles, R= Rt angled triangle, , T= any other triangle) for a triangle with angles 40^0, 60^0, and 80^0.