Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent institution of MAHE, Manipal)

VI SEMESTER B.TECH. (BME) DEGREE MAKE-UP EXAMINATIONS, JUNE 2018

SUBJECT: ARTIFICIAL NEURAL NETWORKS (BME4001)

(REVISED CREDIT SYSTEM)

Wednesday, 20th June 2018: 2 to 5 PM

TIME: 3 HOURS **MAX. MARKS: 100**

Instructions to Candidates:

1. **Answer ALL questions.**
2. **Draw labeled diagram wherever necessary**

1.	(a)	State the characteristics of an artificial neural network and compare it with a biological neural net.	06
	(b)	Design a *McCulloch-Pitt's* neuron as a processing node for realising *OR* function. Test the network with the test vector $X = [\ 1\ 1\ ]^T$.	06
	(c)	Explain the architecture of a hetero associative networks? Explain its training procedure.	08
2.	(a)	What is *activation function*? Explain the following functions: threshold and sigmoidal.	04
	(b)	What are basic models of artificial neural networks?	06
	(c)	Explain the rules for training perceptron net and realize the given al gate function with the help of Hebbian network: $f = A.B$	10
3.	(a)	Draw the architecture of an auto-associative network to store the following pattern: $[-1\ \ -1\ \ -1\ \ 1]$. Explain the procedure for storing the pattern and verify the retrieval of the pattern.	10
	(b)	Explain the architecture of a back propagation neural network (BPNN). Give the important rules for defining the error terms and for updating the weights.	10

4. (a) Explain the important stages and the challenges to be addressed in the design of a classifier. Explain the above stages considering a biological pattern. 10

(b) Explain training and testing algorithm for Heb Net. Design a Hebbian net to realize following function: $f = (A + B)$ 10

5. (a) Draw the architecture of a Kohonen Self organizing network and explain. 06

(b) Define different types of learning methods, and differentiate them. 08

(c) Calculate the output of a neuron Y for the network shown in figure 5(c). Use binary sigmoidal activation function. 06

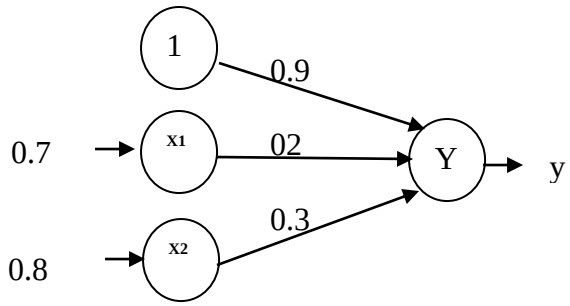

Figure 5 (c)