Code No: C5408 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I Semester Examinations March/April-2011
NEURAL AND FUZZY SYSTEMS
(POWER ELECTRONICS AND ELECTRIC DRIVES)

Time: 3hours **Max.Marks:60**

Answer any five questions
All questions carry equal marks
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1.a) Explain the characteristics of neural networks.
b) Describe McCulloch-Pitts model of a neuron. Design a network using McCulloch-Pitts neuron to realize the NAND gate. [12]

2.a) Differentiate between Supervised and unsupervised learning methods.
b) Discuss the Perceptron learning law.
In a single layer perceptron, unit 1 receives inputs from units 2 and 3. Given that the weights are $w_{1,2} = -3$, $w_{1,3} = 2$, $x_2 = 1$, $x_3 = 1$, $\theta_1 = 1$. Calculate the output O_1. If the desired output $T_1 = 1$, how do you adjust the weights? Assume that the learning rate $\eta = 0.3$. [12]

3.a) Distinguish between sequential mode of back propagation and batch mode of back propagation.
b) Explain the stopping criteria for back propagation algorithm. [12]

4.a) What do you mean by hetro-associative memory? Give an example of hetro associative memory and construct an energy function for the same.
b) State and prove the BAM energy function theorem. [12]

5. Describe the ART network architectures and their learning algorithms. [12]

6.a) Define the term fuzzy relation. What is the cardinality of a fuzzy relation? Discuss.
b) List and discuss operations on fuzzy relation. [12]

7.a) What is membership function?
b) Explain the features of membership function. [12]

8. List and explain in detail about fuzzy logic control system models. [12]

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