P.CODE:37221	R05	SET- 4

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
IV.B.TECH - I SEMESTER REGULAR EXAMINATIONS NOV/DEC, 2009
NEURAL NETWORKS AND FUZZY LOGIC
(Common to EEE, E.CON.E, MEP, AE, ICE, AME)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1. a) Compare the biological neural network with artificial neural network.
   b) Explain the architecture of spiking-neuron model. [8+8]

2. a) Describe the Mc-Culloch – pitt's model of neuron. Design a network using this model to realize the NAND gate.
   b) Classify the learning methods. Give a brief explanation about each. [8+8]

3. State and prove perceptron convergence theorem. [16]

4. Define Kolmogrov theorem and also the difficulties associated with learning in multilayer perceptrons. [16]

5. a) State and prove bi-directional associative memory energy theorem.
   b) With suitable diagram, explain the learning of Boltzmann's machine. [8+8]

6. a) Explain basic fuzzy set operations.
   b) Let X={1, 2, 3, ……10}. Determine the cardinalities and relative cardinalities of the following fuzzy sets.
      i) $\tilde{A}$ = {(2, 0.4), (3, 0.6), (4, 0.8), (5, 1.0), (6, 0.8), (7, 0.6), (8, 0.4)}
      ii) $\tilde{B}$ = {(2, 0.4), (4, 0.8), (5, 1.0), (7, 0.6)} [8+8]

7. List the various defuzzification techniques. Explain each of them in detail. [16]

8. Design and develop an air conditioner controller by fuzzy logic control model. Formulate necessary membership functions and required fuzzy rules for the application. [16]