

IV B.Tech I Semester(R05) Supplementary Examinations, May/June 2010

NEURAL NETWORKS AND FUZZY LOGIC

(Common to Electrical & Electronic Engineering, Electronics & Control Engineering and Instrumentation & Control Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) What are the three models of artificial neuron. Explain them in detail.
(b) Compare and contrast artificial neural networks with conventional computer system. [10+6]
2. (a) With help of suitable diagram, discuss the dynamics of the Hopfield network.
(b) Taking a three-node net, why cannot the following states $V_1 V_2 V_3 = 000, 011, 110$ and 101 be made stable. [6+10]
3. (a) Explain ART network algorithm.
(b) Explain the following terms with respect to Neural networks.
i. Stability
ii. Plasticity
iii. Learning
iv. Architecture. [8+8]
4. (a) What are the major issues arise in plant inverse identification. Explain.
(b) Explain the neural network configuration for plant inverse identification. [8+8]
5. Let $X = \{1, 2, 3, \dots, 10\}$. Determine the cardinalities and relative cardinalities of the following fuzzy sets.
(a) $\tilde{A} = \{(3, 10), (4, 0.2), (5, 0.3), (6, 0.4), (7, 0.6), (8, 0.8), (10, 1), (12, 0.8), (14, 0.6)\}$.
(b) $\tilde{B} = \{(2, 0.4), (3, 0.6), (4, 0.8), (5, 1.0), (6, 0.8), (7, 0.6), (8, 0.4)\}$
(c) $\tilde{C} = \{(2, 0.4), (4, 0.8), (5, 1.0), (7, 0.6)\}$ [6+5+5]
6. Write short notes on the following
(a) Knowledge base in fuzzy logic control system.
(b) Decision making logic in fuzzy logic control system. [8+8]
7. Describe the design of fuzzy logic control with a case study. [16]
8. Design a fuzzy controller for a temperature control system of a room. Assume your own control actions due to which the temperature of the room may vary. Design in fuzzy rule-based system to keep the room at a comfortable temperature. [16]
