

BE / III / 25 / (Bas) / 2011/18

(3 Hours)

Max. Marks: 80

- N.B.: (1) Question No. 1 is compulsory.
 (2) Attempt any Three questions out of remaining Five questions.
 (3) Figures to the right indicate full marks.
 (4) Assume suitable data if necessary.

- Q.1 a Explain with neat diagram supervised and unsupervised learning in NN 5
 b Explain different activation functions in NN 5
 c Explain with example any 2 operators involved in simple GA 5
 d Explain different defuzzification techniques. 5

- Q.2 a Design Hebb Net to implement logical AND function. Use bipolar inputs and targets. 10
 b Explain Error back propagation training Algorithm with the help of flowchart. 10

- Q.3 a Explain architecture of Bidirectional Associative Memory (BAM). How storage and retrieval performed in BAM. 10
 b Explain the single layer Neural Network architecture using Perceptron model with suitable activation function. 10

- Q.4 a Two fuzzy relations are given by
- | | | | | |
|---|----|-----|-----|-----|
| R | | b1 | b2 | b3 |
| | a1 | 0.4 | 0.5 | 0 |
| | a2 | 0.2 | 0.8 | 0.2 |
- | | | | |
|---|----|-----|-----|
| S | | c1 | c2 |
| | b1 | 0.2 | 0.7 |
| | b2 | 0.3 | 0.8 |
| | b3 | 1.0 | 0.0 |
- 10

Find T as a max-min composition and max-product composition between the fuzzy relations.

- b Sketch the 5 layer ANFIS architecture mentioning the task of each layer. 10

- Q.5 a Using Mamdani fuzzy model, Design a fuzzy logic controller to determine the wash time of domestic washing machine. Assume that the inputs are dirt and grease on cloths. Use 3 descriptors for each input variables and five descriptors for output variables. Derive necessary membership function and required fuzzy rules for the application. 15
 b Explain Mamdani's and Zadeh's interpretation of fuzzy rule. 5

- Q.6 Write Short Note on:
- a Explain perceptron convergence theorem 5
 - b Binary Hopfield Network 5
 - c Delta Learning Rule 5
 - d McCulloch Pitts-neuron model 5
