M.Sc. - I (Electronics) (NEP Pattern) Semester-II

PSCELT203 - Paper-III : Fuzzy Logic and Artificial Neural Networks

P. Pages : 1 **GUG/S/25/15371**

Time : Three Hours * 3 0 2 0 * Max. Marks : 80

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labelled diagrams wherever necessary.

Either :

1. a) Explain the basic operations of fuzzy sets and provide examples for each operation. **8**

b) Discuss the properties of fuzzy sets. **8**

OR

c) Explain the various operations of a fuzzy relation. **8**

d) Explain the Triangular Membership function and Trapezoidal membership function. **8**

Either :

2. a) Explain the function of fuzzy sets in the extension principle. **8**

b) Describe the Mamdani Fuzzy Inference System. **8**

OR

c) Explain the graphical techniques of inference with a suitable example. **8**

d) Describe the fuzzy c-means clustering method. **8**

Either :

3. a) Explain the basic building blocks of the artificial neural network. **8**

b) Explain the single – layer and multilayer feed-forward networks. **8**

OR

c) Describe the Reinforcement Learning processes. **8**

d) Discuss the delta learning rule for the multi-perception layer. **8**

Either :

4. a) Describe the recurrent network architecture. **8**

b) Describe the architecture of bidirectional associative memory. **8**

OR

c) Discuss the building blocks of the counter propagation network. **8**

d) Describe the pattern matching in ART. **8**

5. Attempt the following:

a) State the application of fuzzy logic. **4**

b) Explain how the rules are formed in a fuzzy rule-based system. **4**

c) Explain the Hebbian learning rule. **4**

d) Discuss the self-organizing map. **4**

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