

01-06-17



Q.P. Code : 790700

(3 Hours)

[Total Marks : 80

N.B. : (1) Question No.1 is compulsory.

(2) Solve **any three** out of **five** remaining questions.

1. (a) Explain hard limit and soft limit activation function. 5
- (b) Explain Mc Culloch Pitts neuron model with the help of an example. 5
- (c) Explain fuzzy extension principle with the help of an example. 5
- (d) Explain linear separable and non-linearly separable pattern with example. 5
2. (a) What is learning in neural networks? Differentiate between supervised and unsupervised learning. 10
- (b) What are the different types of encoding, selection, crossover, mutations of GA. Explain each type with suitable examples. 10
3. (a) Explain error back propagation training algorithm with the help of a flowchart. 10
- (b) Explain any four defuzzification methods with suitable example. 10
4. Design a fuzzy controller to determine the wash time of domestic washing machine. Assume that input is dirt and grease on clothes. Use three descriptors for input variables and five descriptors for out variables. Derive set of rules for control the action and defuzzification. The design should be supported by figures. Show if the clothes are soiled to larger degree the wash time will be more and vice-versa. 20
5. (a) Prove the following identities : 10
 - (i) For unipolar continuous activation
 $f'(net) = 0(1 - 0)$.
 - (ii) For bipolar continuous activation function
 $f'(net) = 0(1 - 0^2)/2$.
- (b) Explain learning vector quantization Algorithm. 10
6. Write short notes on **any two** : 20
 - (a) Kohonen self-organizing feature maps.
 - (b) ANFIS architecture.
 - (c) Newton Method.