B.E. Eighth Semester (Electronics Engineering) (C.B.S.)

Elective - II: Fuzzy Logic & Neural Network

P. Pages : 2 **KNT/KW/16/7553**

Time : Three Hours * 0 2 5 5 * Max. Marks :80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.

1. State and explain seven artificial neural network learning rules. **14**

OR

2. a) What are different types of ANN models? Explain in brief. **6**

b) Generate o/p of logic Ex-OR Junction using MP's neuron model. **4**

c) Write short note on biological neuron. **4**

3. a) What do you mean by feedforward recall? Explain with neat diagram. **6**

b) Explain delta learning rule for multi-perceptron layer. **7**

OR

4. a) Draw and explain error back propagation training algorithm. **7**

b) How learning is dependent on various factors. State factors for same. **6**

5. a) Write down mathematical foundation of discrete type Hopfield networks. **7**

b) Explain concept of dynamical systems in detail. **6**

OR

6. Explain role of ANN in control system design. Design any two application for controlling systems. **13**

7. a) What do you mean by crisp sets? Explain operations performed on crisp sets using Venn diagram. Also state properties of fuzzy set. **9**

b) For classical sets $A = \{9,5,6,8,10\}$ $B = \{1,2,3,7,9\}$ and $C = \{1,0\}$ defined on universe X of all natural numbers. Prove the properties of associativity and distributivity. **5**

OR

8. a) For following sets $A = \left\{\frac{1}{2} + \frac{0.5}{3} + \frac{0.6}{4} + \frac{0.2}{5} + \frac{0.6}{6}\right\} B = \left\{\frac{0.5}{2} + \frac{0.8}{3} + \frac{0.4}{4} + \frac{0.7}{5} + \frac{0.3}{6}\right\}$ of membership function. Write union, intersection and difference of both also compliment for both. **7**

b) Explain tolerance and equivalence relation with respect to fuzzy logic. **7**

9. What is Defuzzification? Explain defuzzification methods in detail. **13**

OR

10. a) Write short note on following. **8**

i) Extension principle.

ii) Interval Analysis.

b) Explain concept of membership function with diagram. Also write the features of it. **5**

11. a) Draw and explain a genetic fuzzy controller. **8**

b) Explain an application using fuzzy logic for signal processing. **5**

OR

12. Design an image processing application using fuzzy logic approach. **13**

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