M.E. Second Semester (Electrical & Elect.) (New-CGS)

13290 : Neuro Fuzzy Control : 2 EEEME 3

P. Pages : 2
Time : Three Hours

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AW - 3572
Max. Marks : 80

Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.
3. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) What are the different methods of defuzzification? Explain centroid method of defuzzification with suitable example? **7**

b) What do you understand by a universal approximation? **6**

OR

2. a) What are the various ways to assign membership values or function to fuzzy variables? Explain any four ways. **6**

b) State and explain frequently used properties of fuzzy sets. **7**

3. a) Discuss the design of an automobile cruise control system using fuzzy approach. **7**

b) Give an example of several rules of a Takagi Sugeno Fuzzy Controller. What are the design parameter's of this controller. Give an example of a process to which you would apply this controller. **7**

OR

4. a) What are the main assumptions in a fuzzy control system design? **7**

b) What are the primary design issues of a fuzzy controller? Explain. **7**

5. a) Design a neural network to implement the logical Boolean function XOR. **6**

b) What has been the original motivation behind artificial neural networks? Draw a block diagram & give the formulas for an artificial neuron. Explain all term's & symbol. **7**

OR

6. a) Derive the back propagation rule for an output neuron with a sigmoidal activation function. **7**

b) Explain the term "training" of a neural network. What are the step's of the back propagation algorithm. With what neural network architecture is this algorithm used? **6**

7. a) What do you understand by a system identification? How can a neural network be used for identification & control of a nonlinear dynamical system. **7**

b) How do you simulate a PI control with a neural network? Explain with the help of block diagram. **7**

OR

8.	a)	Explain any one application of neural network's in the area of system identification.	7
	b)	Differentiate between direct neural control & indirect neural control.	7
9.	a)	Define hybrid neural net illustrate an :	6
		i) AND fuzzy neuron,	
		ii) OR fuzzy neuron	
	b)	What are the basic principles of fuzzy neural systems?	7

OR

10.	a)	Explain neuro fuzzy control with the help of a block diagram.	7
	b)	What do you understand by ANFIS? Explain.	6
11.		Explain the fuzzy logic based control scheme for thermoelectric cooling of laser materials.	13

OR

12.		Describe the application of a neural control to current control & speed control of inductions motor. Explain various step's in the design.	13

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