A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 59315

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Elective

Electrical and Electronics Engineering

15UEE915 – NEURAL NETWORK AND FUZZY SYSTEM

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The height h(A) of a fuzzy set is defined as h(A)=sup A(x) CO1- R

   (a) h(A) =0 (b) h(A) <0 (c) h(A)=1 (d) h(A)<1

2. A _____ point of a fuzzy set is a point x∈X at which μA(x)=0.5 CO1- R

   (a) Core (b) Support (c) Cross-over (d) α - cut

3. What are the following sequence of steps taken in designing a fuzzy logic machine CO2- R

   (a) Fuzzification → Rule evaluation → Defuzzification

   (b) Fuzzification → Defuzzification → Rule evaluation

   (c) Rule evaluation → Fuzzification → Defuzzification

   (d) Rule evaluation → Defuzzification → Fuzzification

4. Perceptron, Delta, LMS are the learning methods falls under the category of CO2- R

   (a) Error correction learning - learning with a teacher

   (b) Reinforcement learning - learning with a critic

   (c) Hebbian learning

   (d) Competitive learning - learning without a teacher

5. A perceptron is: CO3- R

(a) A single layer feed-forward neural network with preprocessing

(b) A double layer autoassociative neural network

(c) An autoassociative neural network

(d) None of the above

6. Hebbian learning is also called CO3- R

(a) Perceptron (b) Competitive (c) Correlation (d) Associative

7. Which of the following is true? CO4- R

Single layer associative neural networks do not have the ability to:

(i) perform pattern recognition

(ii) find the parity of a picture

(iii) determine whether two or more shapes in a picture are connected or not

(a) (ii) and (iii) are true b) c) d) (b) (ii) is true

(c) (iii) is true (d) None of the mentioned

8. Which of the following is the component of learning system? CO4- R

(a) Goal (b) Model (c) Learning rules (d) All of the mentioned

9. Automatic generation control with fuzzy logic controller in the power system includes CO5- R

(a) Single area (b) Two area (c) Three area (d) All of these

10. The balancing controller is a stabilizing linear controller which can either be a CO5- R

(a) PD (b) PID (c)PI (d) All of these

PART – B (5 x 2= 10 Marks)

11. Name some of the properties of fuzzy sets. CO1- R

12. Define fuzzification. CO2- R

13. Mention different learning methods CO3- R

14. Explain how to encode with different associative memories CO4- R

15. List out any two application of neural networks used for controlling. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) (i) Define classical set CO1- U (8)

(ii) Differentiate fuzzy set from classical set and name the properties of classical (crisp) sets. CO1- U (8)

Or

(b) Using your own intuition and your own definitions of the universe of discourse, plot fuzzy membership functions for the following variables CO1- U (16)

Age of people
(a) Very Young.
(b) Young.
(c) Middle-aged.
(d) old.
(e) Very old.

17. (a) Write short notes on the following. CO2- Ana (8)
(i) Fuzzification interface.

(ii) Knowledge base in fuzzy logic controller. CO2- Ana (8)

Or

(b) Compare fuzzification with defuzzification. Explain different types of Defuzzification methods. CO2- Ana (16)

18. (a) (i) With the help of a neat diagram, explain the analogy of a biological neuron. CO3- Ana (8)

(ii) Explain CO3- Ana (4)
(1) Integrate and Fire Neuron Model
(2) Spiking Neuron Model. CO3- Ana (4)

Or

(b) (i) Explain the back propagation training algorithm. CO3- Ana (8)

(ii) Discuss in detail the steps followed and the terminology used. CO3- Ana (8)

19.	(a)	(i) Construct a Hopfield network to associate 3×3 input images with dots and dashes.	CO4- U	(8)
		(ii) How many spurious attractors does this network have i.e how many patterns other than dots and dashes are stable attractors?	CO4- U	(8)
		Or		
	(b)	Explain in detail about Hetero-Associative memory & Auto-Associative memory?	CO4- U	(16)
20.	(a)	Explain in detail any one application of fuzzy logic controller techniques in power systems.	CO5- U	(16)
		Or		
	(b)	Explain the applications of neural network in load forecasting?	CO5- U	(16)