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

Question Paper Code: 59315

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

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. Fuzzy logic is a form of CO1- R

(a) Two-valued logic (b) Crisp set logic

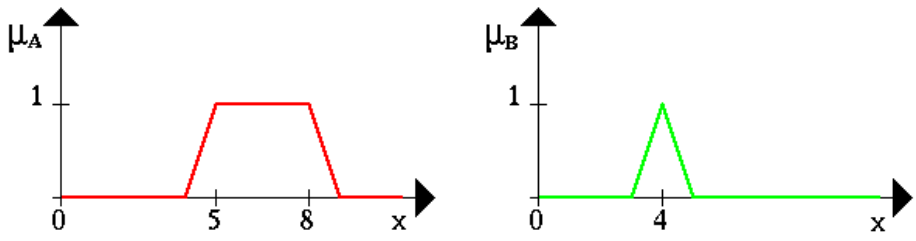
(c) Many-valued logic (d) Binary set logic

2. The truth values of traditional set theory is _____ and that of fuzzy set is _____ CO1- R

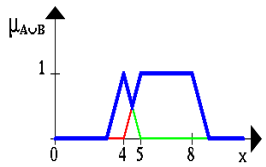
(a) Either 0 or 1, between 0 & 1 (b) Between 0 & 1, either 0 or 1

(c) Between 0 & 1, between 0 & 1 (d) Either 0 or 1, either 0 or 1

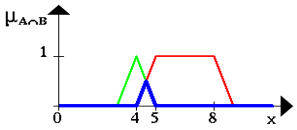
3. Given these fuzzy graphs for member functions A and B which is correct one CO2- R



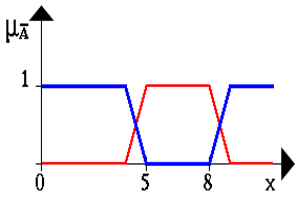
(a)



(b)



(c)



(d) None of the above

4. Consider a fuzzy set old as defined below old={(20,0),(30,0.2),(40,0.4),(50,0.6),(60,0.8),(70,1),(80,1)}. Then the alpha-cut for alpha=0.4 for the set old will be CO2- R

(a) {(40,0.3)}

(b) {50,60,70,80}

(c) {(20,0.1),(30,0.2)}

(d) {(20,0),(30,0), (40,1),(50,1),(60,1), (70,1),(80,1)}

5. A perceptron is CO3- R

(a) a single layer feed-forward neural network with pre-processing

(b) an auto- associative neural network

(c) a double layer auto-associative neural network

(d) a neural network that contains feedback

6. Which of the following is true for neural networks? CO3- R
(i) The training time depends on the size of the network.
(ii) Neural networks can be simulated on a conventional computer.
(iii) Artificial neurons are identical in operation to biological ones.

(a) All of the mentioned

(b) (ii) is true

(c) (i) and (ii) are true

(d) None of the mentioned

7. In Hopfield network with symmetric weights, energy at each state may? CO4 R

(a) Increase (b) decrease

(c) Increase or Decrease (d) decrease of remain same

8. Some of desirable characteristics of associative memories are CO4 R

(a) ability to store large number of patterns (b) fault tolerance

(c) able to recall, even for input pattern is noisy (d) all of the mentioned

9. Fuzzy logic has been very successful in _____ applications. CO5 R

(a) Washing Machines (b) Air Conditioners (c) Dish Washers (d) All of these

10. Neural network applications to power system can be categorized into CO5 R

(a) Regression (b) Classification (c) Combinational optimization (d)All the above

PART – B (5 x 2= 10Marks)

11. Define fuzzy set and list the fuzzy relations commonly used. CO1- R

12. Comparison between fuzzification and Defuzzification. CO2- R

13. Sketch the diagram for sigmoidal activation function. CO3- R

14. Define recurrent network and mention its significance. CO4- R

15. Draw the block diagram for fuzzy logic control in power system automatic generation control. CO5- R

PART – C (5 x 16= 80Marks)

16. (a) Explain about the various membership function formulation and parameterization with suitable diagram. CO1- U (16)

Or

	(b)	(i)Determine the Max-min and max-product composition for the two fuzzy relations, R1= "x is relevant to y", and R2= "y is relevant to z" defined on X*Y and Y*Z, respectively, where X={1,2,3}, Y={α,β,γ,δ}, and Z={a,b}. for the following relation matrices, R1=[0.1 0.3 0.5 0.7; 0.4 0.2 0.8 0.9;0.6 0.8 0.3 0.2] and R2=[0.9 0.1; 0.2 0.3; 0.5 0.6;0.7 0.2]	CO1- App	(8)
		(ii) Discuss about the various fuzzy sets with relevant diagram.	CO1- U	(8)
17.	(a)	Explain about the fuzzy inference system and fuzzy models.	CO2- U	(16)
		Or		
	(b)	Discuss about the methods of defuzzification in detail.	CO2- App	(16)
18.	(a)	(i) Illustrate the McCullaoch Pitts neuron model for Exclusive OR problem.	CO3- U	(8)
		(ii) Distinguish Adaline and Madaline with neat sketches.	CO3- U	(8)
		Or		
	(b)	Sketch the feed forward multi layer perceptron network and discuss the algorithmic steps involved in it.	CO3- U	(16)
19.	(a)	Describe the various types of Hopfield networks with suitable example and state their applications.	CO4- U	(16)
		Or		
	(b)	Explain about the architectures of bi-directional associative memories and algorithms involved in accessing the memories.	CO4- U	(16)
20.	(a)	Design a Fuzzy Logic Controller for Washing Machine with Five inputs & Three outputs with appropriate rule table.	CO5- Ana	(16)
		Or		
	(b)	Discuss the role of artificial neural networks in the field of power systems with a suitable example.	CO5- Ana	(16)