B.E. Seventh Semester (Electronics & Telecommunication / Electronics & Communication Engineering) (C.B.S.) **Elective - I : Fuzzy Logic and Neural Networks**

: 1. A 2. S 3 S	All questions carry marks as indicated.			
4. S 5. S 6. S 7. S 8. D 9. A 10. II	Solve Question 1 OR Questions No. 2. Solve Question 3 OR Questions No. 4. Solve Question 5 OR Questions No. 6. Solve Question 7 OR Questions No. 8. Solve Question 9 OR Questions No. 10. Solve Question 11 OR Questions No. 12. Oue credit will be given to neatness and a Assume suitable data whenever necessary Ilustrate your answers whenever necessary	dequate dimensions. ry with the help of neat s	ketches.	(
State and o	explain seven different network learning	rules.		14
	OR)		
What are o	different type of artificial neural network	models? Explain in deta	ul.	6
Define syn neural net	naptic weight, activation function, thresh work.	old and bias with respect	t to artificial	4
Write sho	rt note on biological neural network.		\sim	4
How learn	ing is dependent on various factors? Stat	te the factors for the sam	e()	6
Explain de	elta learning rule for multi-perceptron lay	ver with expression.	0	7
	OR	5 1012		
Explain fe write error	eed forward recall and error back propaga r back propagation training algorithm.	ation with neat block dia	gram. Also	13
Write dow	vn mathematical foundation of gradient ty	ype Hopfield networks.		7
State and o	explain washing machine as a control sys	stem application using no	eural networks.	6
	OR			_
			20	2
Explain si	gnal processing application i.e. ECG and	EMG using neural netw	vork.	8
Explain th	e concept of dynamical systems in detail	<u>658</u>	M^{\otimes}	5
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	www.solve	out.in		
	2. S 3. S 4. S 5. S 6. S 7. S 8. E 9. A 10. I State and What are of Define synneural net Write shoon How learr Explain do Explain fewrite error Write dow State and Explain si Explain si Explain si Explain th /17/7455	 Solve Question 1 OK Questions No. 2. Solve Question 3 OR Questions No. 4. Solve Question 5 OR Questions No. 6. Solve Question 7 OR Questions No. 8. Solve Question 9 OR Questions No. 10. Solve Question 11 OR Questions No. 12. Due credit will be given to neatness and a Assume suitable data whenever necessary Illustrate your answers whenever necessary What are different type of artificial neural network Define synaptic weight, activation function, thresh neural network. Write short note on biological neural network. How learning is dependent on various factors? State Explain delta learning rule for multi-perceptron lay OR Explain feed forward recall and error back propaga write error back propagation training algorithm. Write down mathematical foundation of gradient ty State and explain washing machine as a control system of a systems in detail Applain the concept of dynamical systems in detail 	 Solve Question 1 OK Questions No. 2. Solve Question 3 OR Questions No. 4. Solve Question 5 OR Questions No. 6. Solve Question 9 OR Questions No. 10. Solve Question 11 OR Questions No. 12. Due credit will be given to neatness and adequate dimensions. Assume suitable data whenever necessary. Illustrate your answers whenever necessary with the help of neat s State and explain seven different network learning rules. OR What are different type of artificial neural network models? Explain in deta Define synaptic weight, activation function, threshold and bias with respect neural network. Write short note on biological neural network. How learning is dependent on various factors? State the factors for the sam Explain delta learning rule for multi-perceptron layer with expression. OR Explain feed forward recall and error back propagation with neat block diag write error back propagation training algorithm. Write down mathematical foundation of gradient type Hopfield networks. State and explain washing machine as a control system application using neural network Explain signal processing application i.e. ECG and EMG using neural netw Explain the concept of dynamical systems in detail.	 Solve Question 1 OK Questions No. 2. Solve Question 5 OR Questions No. 6. Solve Question 7 OR Questions No. 8. Solve Question 9 OR Questions No. 10. Solve Question 9 OR Questions No. 10. Solve Question 11 OR Questions No. 10. Solve Question 20 RQ Questions No. 10. Matta are different network learning rules. OR Write short note on biological neural network. How learning is dependent on various factors? State the factors for the same. Explain delta learning rule for multi-perceptron layer with expression. OR Explain feed forward recall and error back propagation with neat block diagram. Also write error back propagation training algorithm. Write down mathematical foundation of gradient type Hopfield networks. State and explain washing machine as a control system application using neural networks. OR Explain signal processing application i.e. ECG and EMG using neural network. Explain the concept of dynami

For following fuzzy sets A and B

$$\begin{split} & \stackrel{A}{\sim} = \left\{ \frac{0.5}{2} + \frac{0.8}{3} + \frac{0.2}{4} + \frac{0.1}{5} + \frac{0.2}{6} \right\} \\ & \stackrel{B}{\approx} = \left\{ \frac{0.6}{2} + \frac{0.8}{3} + \frac{0.4}{4} + \frac{0.5}{5} + \frac{0.3}{6} \right\} \; . \end{split}$$

Perform union, intersection, difference and complement operation.

b) What do you mean by classical relations? Explain operation performed on them. Also state properties for same.

OR

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- a) For given classical sets $A = \{9,5,6,8,10\}$ $B = \{1,2,3,7,9\}$ $C = \{1,0\}$ defined on universe X of all natural number. Prove the properties of associativity and distributivity.
 - b) Explain tolerance and equivalence relation with respect to fuzzy logic.
 - c) What is compositivity property? Explain it with reference to fuzzy relations.
- a) Write short note on interval analysis.

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- b) What do you mean by fuzzy mapping? Explain in detail.
- c) What is de-fuzzification? State methods for same.

OR

- 10. a) Explain the concept of membership function with neat diagram. Also write its features.
 - b) Design and explain steps used in fuzzy logic controller.
- **11.** a) What is a genetic fuzzy controller? Design a genetic fuzzy controller and explain it with help of an example.
 - b) How temperature of a plant can be controlled using fuzzy logic.

OR

12. Explain the concept of image and signal processing using fuzzy logic in detail with example of each.

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