Q.P. Code: 16EE237 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech IV Year II Semester Regular Examinations September 2020

SOFT COMPUTING TECHNIQUES

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1 **a** Compare artificial neural network with biological neural network. Also discuss the learning process in human brain. **8M**

b Discuss Bias and weights in a neural network. **4M**

OR

2 **a** Explain the characteristics of a neural network. **6M**

b Discuss the learning strategies of neural network in detail. **6M**

UNIT-II

3 **a** What is a perceptron? Discuss its training algorithm. **8M**

b Explain the limitations of back propagation learning. **4M**

OR

4 **a** Discuss Hebbian and delta learning rule. **6M**

b Discuss any one application of neural networks in electrical load forecasting. **6M**

UNIT-III

5 **a** Explain Energy function in BAM and its importance. **6M**

b Briefly explain the working principle of Hopfield network. **6M**

OR

6 **a** What is associative memory? Explain briefly **6M**

b What is hamming distance? Explain. **6M**

UNIT-IV

7 **a** Let $x = \{1,2,3,----,10\}$.

Determine the cardinalities and relative cardinalities of the following fuzzy sets. **4M**

$\tilde{A}$ ={(2, 0.4), (3, 0.6), (4,0.8), (5,1.0), (6,0.8), (7,0.6), (8, 0.4)}

$\tilde{B}$ = {(2, 0.4), (4, 0.8), (5,1.0), (7,0.6)}

b Explain any four operations on fuzzy sets with examples. **8M**

OR

8 **a** What is a fuzzy relation? For the following Fuzzy Relation perform the min-max composition? **6M**

$$\tilde{R}1 = \begin{bmatrix} 0.3 & 0.2 & 0.5 & 0.6 \\ 0.5 & 0.7 & 0.4 & 0.2 \\ 0.4 & 0.2 & 1 & 0.8 \end{bmatrix} \tilde{R}2 = \begin{bmatrix} 1 & 0.2 & 0.6 \\ 0.2 & 0.6 & 0.4 \\ 0.7 & 0.6 & 0.5 \\ 0.5 & 0.4 & 0.8 \end{bmatrix}$$

b Discuss various properties of fuzzy sets with examples. **6M**

UNIT-V

9	**a**	What is fuzzy logic? Using your own intuition of the universe of discourse plot fuzzy membership functions for the following fuzzy variables. i) Very young ii) Young iii) middle aged iv) Old v)Very old	**5M**
	b	Discuss the formulation of fuzzy rule base with an example.	**7M**
		OR	
10	**a**	Discuss any one application of fuzzy logic in electrical engineering. Mention the inputs and outputs and rule base also.	**9M**
	b	What is defuzzification? Discuss in brief.	**3M**

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