Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18CS3085** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SOFT COMPUTING** | **Max. Marks :** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
| **ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)** | | | | |
| 1. | a. | Define soft computing and distinguish hard computing from soft computing. | CO1 | 4 |
| b. | Draw a simple artificial neuron and discuss the calculation of net input. | CO1 | 4 |
| c. | Design a Hebb net to implement logical AND function using bipolar inputs and targets. | CO2 | 8 |
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| 2. | a. | Implement AND function using perceptron networks for bipolar inputs and targets. The activation function to obtain the output Y on the net input is.  Y=f(yin)={1 if yin>0,  0 if yin=0,  -1 if yin<0}  Find decision boundary for given function. | CO2 | 10 |
| b. | Write short notes on Learning vector quantization. | CO2 | 6 |
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| 3. | a. | Enumerate the various defuzzification techniques with example. | CO3 | 10 |
| b. | Interpret and assign the fuzzy membership function for the following   1. Liquid level in tank 2. Height of the people. | CO3 | 6 |
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| 4. | a. | Compare and contrast traditional algorithm with genetic algorithm. | CO4 | 6 |
| b. | Discuss in detail the various basic operators used in genetic algorithm with suitable example. | CO4 | 10 |
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| 5. |  | Explain in detail the ANFIS Architecture. | CO5 | 16 |
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| 6. | a. | Compare and contrast supervised learning with unsupervised learning. | CO2 | 6 |
| b. | Discuss in detail the Bidirectional Associative Memeory with example. | CO2 | 10 |
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| 7. | a. | Consider the following fuzzy sets  i) Construct two relations *R = A* x*B* and *T = B* x*C*  ii) Perform max-min and max-product compositions over the two fuzzy relations (R and T) and obtain a fuzzy relation U and U’ respectively.  iii) Determine the algebraic products of A and B fuzzy sets. | CO3 | 8 |
| b. | State the purpose of Fuzzy Inference System. Explain the concept of Mamdani system. | CO5 | 8 |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Describe the working principle of Convolution Neural Network with a neat sketch. | CO6 | 10 |
| b. | Discuss in detail the Recurrent Neural Networks. | CO6 | 10 |