Registration no: | | | | | | | | | | |

Total Number of Pages: 2 **B.TECH**
PCIT4401

7TH Semester Regular / Back Examination 2015-16
PRINCIPLES OF SOFT COMPUTING
BRANCH: IT
Time: 3 Hours
Max marks: 70
Q.CODE: T192

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: **(2 x 10)**

a) Distinguish between artificial neuron and biological neuron.
b) Construct a 3-4-3-2 feed forward neural network, indicating all parameters properly.
c) What is the necessity of activation function in a neural network?
d) Given A={(10,0.3),(15,0.4),(20,0.9),(25,1),(30,0.8),(35,0.5)} be a fuzzy set defining the set "Young". Find the fuzzy set "very young" from A.
e) Differentiate between fuzzy membership value and probability.
f) What is the role of mutation in GA?
g) Differentiate between linearly separable and nonlinearly separable problems.
h) How elitism affects the performance of GA?
i) What are the applications of GA?
j) Define extension principle.

Q2 **a)** What is a perceptron? Briefly describe the working of Rosenblatt's perceptron with neat diagram. **(5)**

b) Define defuzzification. Discuss briefly about different types of defuzzification techniques available. **(5)**

Q3 **a)** Let R1 and R2 be two fuzzy relations given by **(5)**

$$R1 = \begin{bmatrix} 0.3 & 0.7 & 0.5 & 0.6 \\ 0.4 & 0.5 & 0.1 & 0.9 \\ 0.6 & 0.8 & 0.3 & 0.7 \end{bmatrix} \quad R2 = \begin{bmatrix} 0.4 & 0.8 \\ 0.2 & 0.7 \\ 0.5 & 0.6 \\ 0.9 & 0.2 \end{bmatrix}$$

Find out
i) min-max Composition
ii) min-product composition

b) Define the following terms in fuzzy logic **(5)**
i) support ii) singleton iii) α – cut and strong α-cut

Q4 Explain the back propagation learning mechanism used in multi layer feed forward neural networks with diagram. **(10)**

Q5 **a)** What is the drawback of ADALINE network? How XOR problem can be solved using MADALINE network? **(5)**

b) What are the drawbacks of ANN? How ANFIS is helpful to address these problems? **(5)**

Q6 **a)** Explain the architecture and learning of a Hopfield Neural Network. **(5)**

b) Suggest an approach to solve travelling sales person problem using GA **(5)**

Q7 **a)** What is crossover? Explain about different crossover techniques available in GA with example. **(5)**

b) Discuss briefly about different encoding schemes available in GA **(5)**

Q8 Write short notes on any two: **(5 x 2)**

a) Adaptive resonace theory.

b) Learning in artificial neural network

c) Associative memory

d) Hybrid systems