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Total number of printed pages – 2

B. Tech
PCIT 4401

Seventh Semester (Special) Examination – 2013

PRINCIPLES OF SOFT COMPUTING

BRANCH : IT

QUESTION CODE : D 387

Full Marks – 70

Time : 3 Hours

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

1. Answer the following questions : 2×10
- What are the benefits of Soft Computing over traditional computing ?
 - What is the weight adaptive equation that is used for training a single layer perceptron ?
 - Differentiate between a Fuzzy Set and a Crisp Set.
 - Mention the basic difference between Supervised and Unsupervised learning.
 - What is the difference between Support and Core of a fuzzy set ?
 - What do you understand by Selection in case of Genetic Algorithm ?
 - Draw a 2-5-4-3 feed-forward neural network with proper labeling.
 - What is the use of Genetic Algorithm ?
 - What is crossover operation in Genetic Algorithm ?
 - What do you mean by hybrid neural network ?
2. Following nonlinear problem needs to be solved by GA. It is decided to find three decimal places of accuracy. :
- Minimize $(x_1 - 2.5)^2 + (x_2 - 5)^2$
- Such that $5.5x_1 + 2x_2^2 - 18 \leq 0$ and $0 \leq x_1, x_2 \leq 5$
- Find the chromosome length of individual in the population of GA. 5
 - What will be the fitness function ? 5

P.T.O.

3. Two fuzzy relations are given by

$$R = \begin{matrix} & y_1 & y_2 \\ x_1 & \begin{bmatrix} 0.6 & 0.3 \end{bmatrix} \\ x_2 & \begin{bmatrix} 0.2 & 0.9 \end{bmatrix} \end{matrix} \quad S = \begin{matrix} & z_1 & z_2 & z_3 \\ y_1 & \begin{bmatrix} 1 & 0.5 & 0.3 \end{bmatrix} \\ y_2 & \begin{bmatrix} 0.8 & 0.4 & 0.7 \end{bmatrix} \end{matrix}$$

(a) Find the max-min composition. 5

(b) Find the max-product composition. 5

4. What do you mean by Defuzzification ? Explain, the following defuzzification methods :

(i) Centroid of area

(ii) Bisector of area

(iii) Mean of maximum

(iv) Smallest of maximum

Largest of maximum

10

5. (a) What do you mean by back propagation network ? Discuss the architecture of a back propagation network. 5

(b) Explain the effect of tuning parameters of the back propagation neural network. 5

6. (a) Explain the Rank selection in chromosome selection of reproduction. 5

(b) Describe multi point cross-over in Genetic Algorithm. 5

7. (a) Distinguish between MLP and RBF Neural Network with their relative merits and demerits. 5

(b) Specify different properties of Neural Network. 5

8. Write short notes on any **two** of the following : 5×2

(a) ART1

(b) RBF Network

(c) Self organizing and Reinforcement training

(d) Activation Function.

