

Roll No. ....

Total Pages : 3

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BT-6/M-24

SOFT COMPUTING

Paper-PC-CS-AIDS-310A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

**UNIT-I**

1. (a) Outline the differences between Hard Computing and Soft Computing. (7)  
(b) Discuss major areas of soft computing. (8)
2. (a) Classify the various types of soft computing techniques. (8)  
(b) Discuss the various requirements for soft computing. (7)

**UNIT-II**

3. (a) What is a neural network? Explain the working of an artificial neuron. How is it similar to a biological neuron? Draw neat diagrams to explain the answer. (8)  
(b) A neuron with three input has the weight vector  $w = [0.1 \ 0.2 \ -0.3]$ . The activation function is binary sigmoidal. If the input vector is  $[0.6 \ 0.8 \ 0.4]$ , then find the output of the neuron? (7)

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4. (a) Describe the self-organizing feature map. How to find the change in weight value in SOM network. (8)
- (b) Explain architecture of Bidirectional Associative Memory (BAM). How storage and retrieval performed in BAM. (7)

### UNIT-III

5. (a) The fuzzy relations are given as :

$$R = \begin{matrix} & y_1 & y_2 & y_3 \\ x_1 & \begin{bmatrix} 0.1 & 0.2 & 0.3 \end{bmatrix} \\ x_2 & \begin{bmatrix} 0.4 & 0.5 & 0.6 \end{bmatrix} \end{matrix}$$

$$S = \begin{matrix} & z_1 & z_2 \\ y_1 & \begin{bmatrix} 0.8 & 0.1 \end{bmatrix} \\ y_2 & \begin{bmatrix} 0.6 & 0.9 \end{bmatrix} \\ y_3 & \begin{bmatrix} 0.4 & 1.0 \end{bmatrix} \end{matrix}$$

Find  $R \circ S$  using (a) max-min composition (b) max-product composition. (8)

- (b) What is fuzzy logic? How is it different from binary logic? Discuss applications of fuzzy logic. (7)
6. (a) Explain fuzzy inference. Describe the types of procedures used in fuzzy inference. (8)
- (b) Explain the characteristics and different classifications of a neuro-fuzzy hybrid system. (7)

#### UNIT-IV

7. (a) List the stopping condition for Genetic Algorithm Flow. (8)
- (b) Summarize the sequential procedures involved in the cross-over and reproduction phase of GA with typical examples. (7)
8. (a) State the properties of the Genetic Neuro Hybrid System. Draw the block diagram of the Genetic Neuro Hybrid System. (8)
- (b) Explain four mutation methods. (7)
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