BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

B. Tech. Sem - VI COMPUTER SCIENCE & ENGINEERING AI & ML : SUMMER : 2024

SUBJECT: SOFT COMPUTING

Day : Monday
Date : 03/06/2024

S-23975-2024

Time : 02:30 PM-05:30 PM
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY**.
2) Figures to the **RIGHT** indicate **FULL** marks.
3) Assume suitable data **WHEREVER** necessary.
4) Draw neat labeled diagrams **WHEREVER** necessary.

Q.1 Define soft computing. What are the different applications of soft computing? **(10)**

OR

Q.1 Explain different soft computing Techniques in detail. **(10)**

Q.2 Compare and contrast biological neuron and artificial neuron. Obtain the output of the neuron for a network with inputs given as [x1, x2] = [0.7, 0.8] and the weights are [w1, w2] = [0.2, 0.3] with bias = 0.9, use sigmoidal activation function **(10)**

OR

Q.2 Explain difference between Auto associative and Hetro associative Memory. Train auto associative neural network using outer product rule to store input vector [1, 1, -1, 1] and [1, 1, 1,-1] to output row vector. **(10)**

Q.3 Explain different evolution strategies. **(10)**

OR

Q.3 What is particle swarm optimization? Explain in detail. **(10)**

Q.4 What are the different operation of fuzzy sets? The fuzzy relations are given as **(10)**

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

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

Perform composition over the two given fuzzy relations and obtain a fuzzy relation T.

OR

Q.4 Design fuzzy controller of washing machine. **(10)**

Q.5 What are Genetic Algorithms (GA)? Explain the operators in GA? **(10)**

OR

Q.5 Mention the stopping condition for genetic algorithm flow. Give difference between uniform and three parent crossovers. **(10)**

Q.6 Explain Genetic Neuro Hybrid System using the block diagram also state its properties **(10)**

OR

Q.6 What are different applications of hybrid soft computing system? **(10)**

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