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Compute the different tools of Soft Computing according to its characteristics.

**Unit-II**

2. (a) Draw simple single layer neural network architecture and explain its various parts.  
(b) What do you understand by linear separable problem? Explain with suitable example.

**OR**

- (a) Differentiate supervised learning with unsupervised learning.  
(b) Write Kohonen learning algorithm in detail.

**Unit-III**

3. (a) Explain the different operations of Fuzzy set.  
(b) Consider two Fuzzy sets as given below:

$$A = \left\{ \frac{0.2}{\text{train}} + \frac{0.5}{\text{bike}} + \frac{0.3}{\text{boat}} \right\}$$
$$B = \left\{ \frac{1}{\text{train}} + \frac{0.2}{\text{bike}} + \frac{0.4}{\text{boat}} \right\}$$

Find out the following :

- (i)  $A \cup B$   
(ii)  $A \cap B$   
(iii) Proof De Morgan's Law

**OR**

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- (a) What are the various properties of Fuzzy set ?
- (b) Define Fuzzy relation. Explain the various operations of Fuzzy relation.

**Unit-IV**

4. (a) Explain the various encoding methods of Genetic algorithm.
- (b) Write Pseudocode of basic genetic algorithm along with flow chart.

**OR**

- (a) What is the role of Crossover probability and mutation probability? Explain with suitable example.
- (b) Write short note on the application of genetic algorithm.

**Unit-V**

5. (a) What do you understand by hybrid soft computing? Write the names of atleast two hybrid soft computing models.
- (b) Write the steps of creating a neural network model using any GUI of MATLAB.

**OR**

Draw the architecture of ANFIS and explain the purpose of each layer in detail.

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