





- (v) Backpropagation can be defined as \_\_\_\_\_
- It is another name given to the curvy function in the perceptron.
  - It is the transmission of errors back through the network to adjust the inputs.
  - It is the transmission of error back through the network to allow weights to be adjusted so that the network can learn.
  - None of the above
- (vi) What is the name of the network, which includes backward links from the output to the inputs as well as the hidden layers?
- Perceptron
  - Self-organizing maps
  - Multi-layered perceptron
  - Recurrent neural network
- (vii) In how many steps does a crossover operator proceed?
- 2
  - 3
  - 4
  - 5
- (viii) \_\_\_\_\_ deals with uncertainty problems with its own merits and demerits
- Neuro-fuzzy
  - Neuro-genetic
  - Fuzzy-genetic
  - None
- (ix) A priory technique requires knowledge to define the relative importance of objectives prior to search
- True
  - False
- (x) Lexicographic ordering is and a Pareto based approach
- True
  - False
2. (a) What is supervised learning? How it is different from unsupervised learning? (2+3 = 5)
- (b) What is activation function? Explain any two of them. (2+3=5)
- (c) What is ANN? Explain weights and bias related with ANN. (1+4=5)
3. (a) What do you mean by local minima and global minima? Explain objective function. (3+2=5)
- (b) Briefly explain the difference between crisp set and fuzzy set. (5)
- (c) What is fuzzy logic? Explain membership function and membership values. (2+3=5)



4. (a) What are fuzzy propositions? Let's say P and Q are two propositions given as  
P: Marry is efficient; Truth value (P) = 0.8  
Q: Ram is efficient; Truth value (Q) = 0.6  
Find the truth value for the following two proposition
- (i) Mary is not efficient  
(ii) Mary is efficient and so is Ram. (2+3 = 5)
- (b) What is defuzzification? Explain any two defuzzification methods. (1+4=5)
- (c) What are fuzzy vectors? Let 'a' and 'b' are two fuzzy vectors of length 4 and are given by (1+4=5)  
 $a = (0.5, 0.2, 1.0, 0.8)$   
 $b = (0.8, 0.1, 0.9, 0.3)$   
Find the inner product and outer product for these two fuzzy vectors.
5. (a) What is Genetic algorithm? Explain Selection and Crossover operators in detail. (5)  
(b) What is hybrid Genetic algorithm? Explain the importance of it. (2+3=5)  
(c) What are fuzzy set operations? Explain any two of them in details. (2+3=5)
6. (a) What is multi objective optimization problem (MOOP)? Explain why solving MOOP is an issue. (2 +3= 5)  
(b) Briefly explain Lexicographic ordering method in detail. (5)  
(c) What is pareto-based and non-pareto based approaches? Explain the difference between them. (3+2=5)
7. (a) What are fuzzy relations? Let A and B are two fuzzy sets given by  
 $A = \{(x_1, 0.5), (x_2, 0.1), (x_3, 0.4)\}$   
 $B = \{(x_1, 0.2), (x_2, 0.3), (x_3, 0.5)\}$   
Find  $A \cup B$  and  $A \cap B$ . (1+4=5)

- (b) Let  $X$  be the universal set and let  $A$ ,  $B$ , and  $C$  be the subsets of  $X$ . The basic assignments for the corresponding focal elements are mentioned in the following table. Determine the corresponding belief measure. (10)

Focal Elements	$m(\cdot)$
$P$	0.04
$B$	0.04
$E$	0.04
$P \cup B$	0.12
$P \cup E$	0.08
$B \cup E$	0.04
$P \cup B \cup E$	0.64

BINA CHOWDHURY CENTRAL LIBRARY  
WILMIT & TIPS  
3342 Hathi, Wapara,  
Wahga, 731017