Total No. of printed pages = 4
MCA 202 E 32
Roll No. of candidate 11/2/ 2021 BINA CHOWDHURY CENTRAL LIBRARY (SAMULT OF THE BLUE CONTROLL LIBRARY) FORMULA CHOWDHURY CENTRAL LIBRARY (SAMULT OF THE BLUE CONTROLL LIBRARY) FORMULA CHOWDHURY CENTRAL LIBRARY (SAMULT OF THE BLUE CONTROLL LIBRARY) FORMULA CHOWDHURY CENTRAL LIBRARY (SAMULT OF THE BLUE CONTROLL LIBRARY) FORMULA CHOWDHURY CENTRAL LIBRARY (SAMULT OF THE BLUE CONTROLL LIBRARY) FOR CHOWDHURY CENTRAL LIBRARY (SAMULT OF THE BLUE CONTROLL LIBRARY (SAMULT OF THE BL
M.C.A. 3rd Semester End-Term Examination
Elective III - SOFT COMPUTING
New Regulation (w.e.f. 2020-21) & New Syllabus (w.e.f. 2020-21)
Full Marks -10
The figures in the margin indicate full marks for the questions.
Answer question No. 1 and any four from the rest.
1. Answer the following (MCQ/ Fill in the blanks): (i) Which of the following is associated with fuzzy logic? (a) Crisp set logic (b) Many-valued logic (c) Two-valued logic (d) Binary set logic (ii) Which of the following fuzzy operators are utilized in fuzzy set theory? (a) AND (b) OR (c) NOT (d) All of the above (iii) A perceptron can be defined as (a) A double layer auto-associative neural network (b) A neural network with feedback (c) An auto-associative neural network (d) A single layer feed-forward neural network with pre-processing
(iv) What are the advantages of neural networks over conventional computers? (I) Neural networks learn from examples (II) They are more fault-tolerant (III) They are well suited for real-time operation due to their high computational rates (a) (I) and (II) are correct (b) (I) and (III) are correct (c) Only (I) (d) All of the above

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

- 4. (a) What are fuzzy propositions? Let'ssay P and Q are two propositions given asP: 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(.)
P	0.04
B	0.04
E	0.04
$P \cup B$	0.12
$P \cup E$	0.08
$B \cup E$	0.04 CNONUNT STATE OF
$P \cup B \cup E$	0.04 0.64 BINA CHOMORULE SALVANDE
	Blis