PRN:		Course Code :	CST4132

Final Year **B. Tech** End Semester Examination Winter 2022

Soft Computing

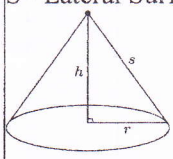
Day and Date: Monday, 19.12.22 Max Marks: **100**

Time : 10.30am - 1.30pm Duration: **03** hrs

Q.1		**Attempt the following**	Marks	Bloom's Level	CO
	a)	How to Represent classical sets and fuzzy sets? Explain	08	L4	1
	b)	Determine the characteristics of soft computing and fundamental paradigms.	08	L3	1
		OR			
	b)	Explain the importance of fuzzy logic and applications of soft computing.	08	L4	1
Q.2		**Attempt the following**			
	a)	Determine the various Fuzzy set operations and try to illustrate with an example by using complement operation of fuzzy sets	08	L3	2
	b)	Determine the various Fuzzy set operations and try to illustrate with an example by using intersection operation of fuzzy sets	08	L3	2
		OR			
	b)	Explain the properties of Fuzzy sets and construct the relation of the following M x N $M = \{0/x1 + 0.8/x2 + 1/x3 + 0.8/x4 + 0/x5\}$ $N = \{0/y1 + 0.2/y2 + 0.7/y3 + 1/y4 + 0.7/y5\}$	08	L4	3
Q.3		**Attempt any two from the following**			
	a)	Explain various types of membership functions with suitable examples	08	L4	3
	b)	How to convert fuzzy set to crisp set? Explain with Maxima methods of the values {4,6,8,10,12}	08	L4	3
	c)	Determine the block diagram of Fuzzy Inference System.	08	L3	3
Q.4		**Attempt any two from the following**			
	a)	Solve the following Knapsack problem by using Genetic Algorithm	08	L6	4
	b)	Explain the block diagram of Genetic Algorithm and also explain various types of cross over operations with examples	08	L3	4
	c)	Solve the Travelling sales man problem by using Genetic Algorithm considering 10 cities and define the distance accordingly	08		
Q.5		**Attempt any Two of the following**			
	a)	Minimize the cost and time of the following problem by using Non- Dominated Sorting in Multi Objective Optimization problem	09	L3	4

Items	Weight	Value
A	6kg	14
B	4kg	6
C	8kg	12
D	9kg	16

ESE 01/02

		Air lines / Time / Cost(In thousands) Indigo 2 7.5 Air India 3 6 Vistara 3 7.5 Spice jet 4 7.5 Star 6 6.5 Air Asia 5 4.5 Singapore 5 6 Air Malaysia 5 7 Deccan 6 6.5			
	b)	State the differences in the working principles of the following optimization problems a. Single – objective optimization problem b. Multi – modal optimization problem Multi – objective optimization problem	09	L3	3
	c)	A Right Circular cone is to be designed with minimum possible total area (T)as well as minimum possible lateral surface Area(S) Variables considered for the right circular cone: R= base radius h= height V= volume sh= slant ht - $\sqrt{r^2+h^2}$ B – base area $= \pi x r^2$ S= Lateral Surface area = $\pi \; x \; r \; x \; sh$  T= Total area = B +S = $\pi \, r(r + sh)$ Two input variables : r, h $r \in [0,10]cm$, $h \in [0,20]cm$	09	L3	3
Q.6		**Attempt any Two of the following**			
	a)	How does LSTM network work? Explain What is the difference between epoch, Batch and iteration in Deep Learning? Explain What do you mean by Tensor in Tensor flow and what are the programming elements in Tensor flow.? Explain	09	L3	4
	b)	Explain Bagging and Boosting What do you understand by transfer learning? Explain also list few commonly used Transfer learning models. What is Data Augmentation in Deep Learning? Explain	09	L3	4
	c)	Why is Deep Neural Network better than a shallow Neural Network? Explain How can you train hyperparameters in Neural Networks? Explain How does LSTM N/W work? Explain	09	L3	4

ESE 02/02