

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3160619****Date:06/06/2022****Subject Name:Soft Computing Techniques****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) Differentiate “Soft” computing versus “Hard” computing.	03
(b) What is fuzzy set and membership function?.	04
(c) Describe characteristics of soft computing and give any two example of soft computing in civil engineering.	07
Q.2 (a) Define support, core and normality terminology.	03
(b) Explain union and intersection operation with example.	04
(c) Explain application of fuzzy logic in civil engineering and day to day practice.	07
OR	
(c) Give crisp set $A = \{1,2,3,4\}$ find the relation matrix for the relation $R = \{(a,b)/b=a+1, a,b \in A\}$ and $S = \{(a,b)/b=a+2, a,b \in A\}$ and also find $R \cup S$, $R \cap S$, compliment of R.	07
Q.3 (a) Define genetic algorithm and its application.	03
(b) What is defuzzification and enlist different defuzzification Techniques?	04
(c) Derive $R \cdot S$ (max. min. composition) for x and $y = \{1,3,5\}$ and relation matrix $R = \{(x,y)/ y=(x+2)\}$, $S = \{(x,y)/ x < y\}$ here R and S is $x * y$.	07
OR	
Q.3 (a) Explain basic GA. Framework.	03
(b) Enlist simple genetic algorithm parameter and its features.	04
(c) Determine a fitness value of a function $f(x,y) = (x-6)^2 + (y-3)^2$ for a string 110010,000100,100001 having string length of first 3 bits for X and remaining 3 bits are for Y.	07
Q.4 (a) Differentiate artificial neural network and biological neural network.	03
(b) Describe biological and it’s working.	04
(c) Explain crossover and mutation in detail	07
OR	
Q.4 (a) Explain chromosomes ,gene, and allele in brief.	03
(b) Enlist the step for solving problem using GA in MATLAB.	04
(c) Explain different ANN architectures.	07
Q.5 (a) Explain ANN and enlist the element of neural network.	03
(b) What are the advantages of hybrid systems?	04
(c) Explain genetic neural system in detail.	07
OR	
Q.5 (a) What do you mean by hybrid system in Soft computing	03
(b) Give the advantages of ANN.	04
(c) Describe fuzzy neural system with its working flow advantages and disadvantages.	07
