GIET UNIVERSITY, GUNUPUR – 765022

Ph.D. (Second Semester) Examinations, November – 2023

PPECS2016 – Soft Computing

(CSE)

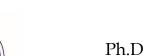Time: 3 hrs   Maximum: 70 Marks

The figures in the right hand margin indicate marks.

Answer ANY FIVE Questions   (14 x 5 = 70 Marks)

		Marks
1.a.	Differentiate between soft computing and hard computing.	7
b.	Explain about the general ART Architecture.	7
2.a.	Two fuzzy sets are given as:	7

$$A = \{0.4/2, 0.6/3, 0.8/4, 1/5, 0.8/6, 0.6/7, 0.4/8\}$$

$$B = \{0.4/2, 0.8/4, 1/5, 0.6/7\}$$

Find the following operation on the given 2 fuzzy sets.

(i)   Union (ii)   Intersection   (iii)   Difference

b.	What is fuzzy inference system? With example explain two inference systems.	7
3.a.	Explain the principle of the gradient descent algorithm. Accompany your explanation with a diagram. Explain the use of all the terms and constants.	7
b.	What is the use of associative memory in the context of neural network?	7
4.a.	What is multi-layer feed forward learning? How the computations are performed at the different layer of Multi-layer neural network?	14
5.a.	What is Back Propagation Network? Draw the Back Propagation Network architecture. Write the Back propagation networking algorithms.	14
6.a.	What is Genetic algorithm? Give three methods of selecting chromosomes for parents to crossover.	7
b.	What do you mean by objective function? Consider the problem maximizing the function $f(x) = x2$ using the genetic algorithms, where 'x' varies between 0 and 31.	7
7 a.	Write the python code to union two fuzzy set.	7
b.	Taking one example write the Python/ Matlab code to find the Max- product composition of fuzzy relation.	7
8 a.	What are classifier and its purpose? Explain about various type of classifier used in machine learning.	7
b.	How is the k-nearest neighbor algorithm different from k-means clustering?	7

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