Seat. No. _____

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BE SEMESTER-VI(New) Examination April-2025

Subject Name: Soft Computing **Subject Code: CT605A-N**

Date: 16/04/2025 **Time: 12:30pm – 03:30pm** **Total Marks: 70**

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are Compulsory.
4. Indicate clearly, the option you attempt along with its respective question number.
5. Use the last page of main supplementary of rough work.

Section-I

Q-1 (A) Define Soft Computing. Discuss application of Soft Computing. [5]

(B) Find out Error of the given network (in figure 1), where two inputs and one output, the values lie between -1 to 1, hence there is no need to normalize the value. Assume two neurons in the hidden layer. [5]

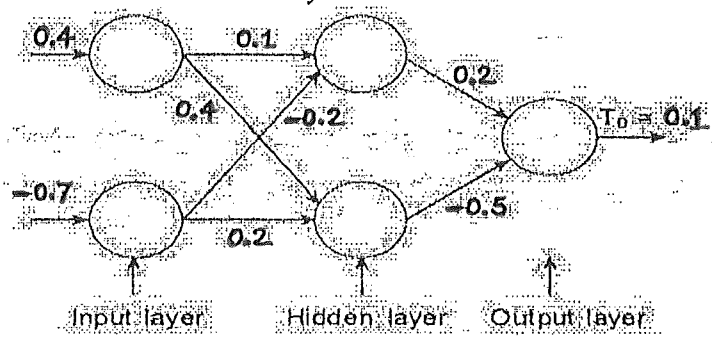

Figure 1: MFNN Neural Network

(C) Give the difference between soft Computing and Hard computing. [5]

OR

(C) Explain Characteristics of neural Network. [5]

Q-2 (A) Explain Supervised, Unsupervised and Reinforced Learning Method of Neural Networks. [5]

(B) What is Associative Memory? Explain it's with suitable diagram. [5]

OR

(A) Explain ADALINE with suitable diagram. [5]

(B) Give the difference between Single Layer Feed Forward and Multilayer Feed Forward. [5]

Q-3 (A) What is Defuzzification? List out defuzzification methods and explain any one of it. [5]

(B) To explain and prove kosko's BAM, whare consider the number of patterns, N=3 [5]

A1 = (100001) B1 = (11000)
A2 = (011000) B2 = (10100)
A3 = (001011) B3 = (01110).

OR

(A) Discuss any two activation function in neural network. [5]

(B) Define two fuzzy sets $\tilde{I}$ and $\tilde{F}$ to represent the identification of character I and F. [5]

$\tilde{I}$ ={(F,0.4),(E,0.3),(X,0.1),(Y,0.1),(I,0.9),(T,0.8)}
$\tilde{F}$ =(F,0.99),(E,0.8),(X,0.1),(Y,0.2),(I,0.5),(T,0.5)
Find the following, 1) $\tilde{I} \cup \tilde{F}$ 2) $\tilde{I} - \tilde{F}$ 3) $\tilde{F} \cup \tilde{F}'$

Section-II

Q-4 (A) Explain Neural Network Architecture. [5]

(B) Explain Sequential and Embedded Hybrid System. [5]

(C) Explain GA based Weight Determination. [5]

OR

(C) Compare Fuzzy Logic with Genetic algorithm techniques. [5]

Q-5 (A) Write various advantages and disadvantages of Genetic Algorithm. [5]

(B) What do you mean by hybrid system? Explain embedded hybrid system. [5]

OR

(A) Explain De Morgan's Law in terms of fuzzy sets. [5]

(B) Explain working principle of Genetic Algorithm. [5]

Q-6 (A) To find out X* (Defuzzified value) using centroid method. Here figure(2) illustrates the aggregate of the fuzzy sets. [5]

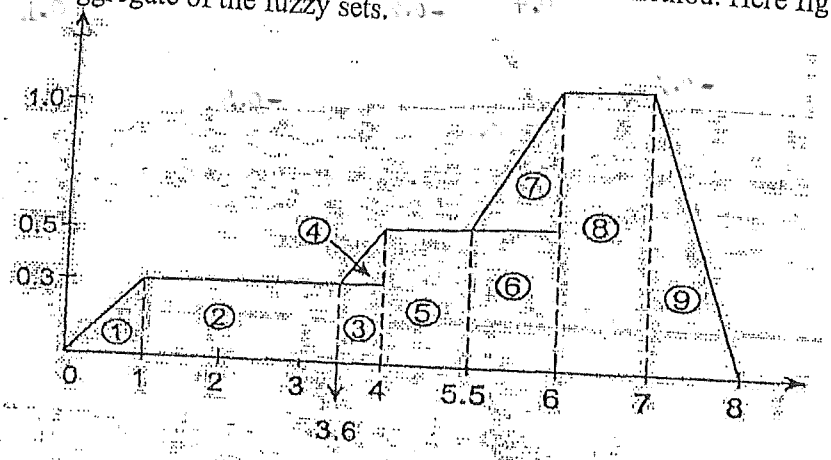

Figure 2: Aggregated fuzzy set

(B) Discuss the application of Fuzzy BP Network. [5]

OR

(A) Consider the following patterns (Autocorrelator)
A1=(-1,1,-1,1) A2=(1,1,1,-1) A3=(-1,-1,-1,1) [5]
Find out following terms.
1) Recognition of stored pattern. 2) Recognition of noisy pattern.

(B) Explain neuro genetic hybrids. [5]

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