

28/11/13

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B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2013

31

Information Technology

VIII Semester

IT9035 – SOFT COMPUTING

(Regulation 2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Define the learning approaches (supervised, unsupervised and Reinforcement) in Artificial neural networks.
2. Draw the architecture of a Back Propagation Network.
3. Define the Classical Relations and Fuzzy Relations.
4. Narrate the main basic features involved in characterizing the Fuzzy set membership function.
5. State the following modes of Fuzzy approximate reasoning.
a. Categorical b. Qualitative c. Syllogistic d. Dispositional
6. What are Fuzzy measures?
7. Write the benefits of Genetic Algorithm.
8. Narrate the three types of Parallel Genetic Algorithm.
9. Show the taxonomy of representation of Genome, Crossover operator and mutation operator of a Genetic Algorithm based Internet search.
10. What is Bayesian Belief Network?

Part – B (5 x 16 = 80 marks)

11. Construct a Kohonen Self-organizing map to Cluster the below given four Vectors.

[0 0 1 1], [1 0 0 0], [0 1 1 0], [0 0 0 1]

The number of Clusters to be formed is TWO. Assume an initial learning rate of 0.5

- 12(a). Discuss about the following with suitable Examples.

i) Classical Equivalence & Tolerance relations.

ii) Fuzzy Equivalence & Tolerance relations.

(or)

- 12(b). Explain the Construction, Working principle and the methods of Fuzzy inference Systems.

13(a). Discuss about the architecture & operation of Fuzzy Logic Controller system (FLC), FLC system models and applications of FLC Systems.

(or)

13(b). Consider an image processing application to locate the objects within a scene. Consider the below given fuzzy sets representing a Plane and Train image in the scene.

$$\text{Plane} = \{0.2/\text{train} + 0.5/\text{bike} + 0.3/\text{boat} + 0.8/\text{Plane} + 0.1/\text{House}\}$$

$$\text{Train} = \{1/\text{train} + 0.2/\text{bike} + 0.4/\text{boat} + 0.5/\text{plane} + 0.2/\text{house}\}$$

Find the following as per the Fuzzy sets given above.

a) $\text{Plane} \cup \text{Train}$

b) $\text{Plane} \cap \text{Train}$

c) $\overline{\text{Plane}}$

d) $\text{Plane}/\text{Train}$

e) $\overline{\text{Plane} \cap \text{Train}}$

f) $\overline{\text{Plane} \cup \text{Plane}}$

g) $\text{Plane} \cap \overline{\text{Plane}}$

f) $\text{Train} \cap \overline{\text{Train}}$

14(a). Neatly explain the steps in Genetic Algorithm and also the Genetic Algorithm operators with suitable examples.

(or)

14(b). Write short notes on the following variants of Genetic Algorithm (GA).

a) Messy GA

b) Adaptive GA

c) Hybrid GA

d) Parallel GA

15.(a). Discuss in detail about the Genetic Algorithm based Internet Search Technique.

(or)

15(b). Explain the following Soft Computing hybrid Fuzzy paradigms for automated learning in Robotic systems.

a) Neuro Fuzzy System

b) GA Fuzzy System

c) GP Fuzzy System