

G 758

(Pages : 2)

Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2014

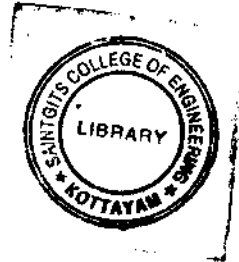
Seventh Semester

Branch : Applied Electronics and Instrumentation Engineering

AI 010 706 L04—FUZZY LOGIC (Elective II) (AI)

[2010 Admissions]

(Improvement/Supplementary)



Time : Three Hours

Maximum : 100 Marks

Part A

Answer all questions.

Each question carries 3 marks.

1. Explain law of excluded middle on Fuzzy sets.
2. Discuss s norms on Fuzzy sets.
3. What is reflexivity Fuzzy relation.
4. Mention operations on Fuzzy relations.
5. State extension principles.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Explain complement, union and intersection operations on Fuzzy sets.
7. Draw the block diagram of a Fuzzy inference system and explain knowledge base.
8. Explain binary relation on a single set.
9. Explain decision-making logic in a Fuzzy Logic Controlled System.
10. Explain the process of concentration dilation.

(5 × 5 = 25 marks)

Part C

Answer all questions.

Each question carries 12 marks.

11. Explain various membership functions used in Fuzzy Logic.

Or

12. Explain complement, intersection and subset hood in Fuzzy sets.

Turn over

13. Give two Fuzzy sets \underline{I} and \underline{F} , find (a) $\underline{I} \cup \underline{F}$; (b) $\underline{I} - \underline{F}$; (c) $\underline{I} \cap \underline{F}$; (d) verify DeMorgan law.

$$\underline{I} = \left\{ \frac{0.3}{1} + \frac{0.2}{2} + \frac{0.1}{3} + \frac{0.6}{4} + \frac{0.8}{5} \right\}$$

$$\underline{F} = \left\{ \frac{0.2}{1} + \frac{0.3}{2} + \frac{0.4}{3} + \frac{0.7}{4} + \frac{1}{5} \right\}$$

Or

14. Explain the various properties of Fuzzy sets.
15. Explain the different operations on Fuzzy relations.

Or

16. Given two relations :

$$\underline{R} = \begin{matrix} & y_1 & y_2 \\ \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} & \begin{bmatrix} 0.5 & 0.1 \\ 0.3 & 0.9 \\ 0.8 & 0.6 \end{bmatrix} \end{matrix} \text{ and}$$

$$\underline{S} = \begin{matrix} & z_1 & z_2 & z_3 \\ \begin{matrix} y_1 \\ y_2 \end{matrix} & \begin{bmatrix} 0.6 & 0.4 & 0.3 \\ 0.5 & 0.8 & 0.1 \end{bmatrix} \end{matrix}$$

Find $\underline{R} \circ \underline{S}$ by max-min method and max-product composition method.

17. Explain Fuzzification interface, rule base, data base, decision-making logic in a Fuzzy logic controlled system.

Or

18. Explain various defuzzification methods used in a Fuzzy Logic controller.
19. Describe an application of Fuzzy Logic in control system.

Or

20. Describe a Fuzzy logic controller based inverted pendulum.

(5 × 12 = 60 marks)

