COURSE   : OPTIONAL
PAPER   : FUZZY SET THEORY FUZZY LOGIC AND APPLICATIONS
TIME : 3 HOURS   MAX. MARKS :   100

SECTION A
ANSWER ANY FIVE QUESTIONS   (5 × 8 = 40)

1. Prove that fuzzy t-norm and t-conorm are dual to each other with respect to the fuzzy complement using an example.
2. Construct fuzzy real line and discuss arithmetic operations on fuzzy numbers
3. Find the solutions to the fuzzy equations: i) $A + X = B$; ii) $A \cdot X = B$
4. Explain binary fuzzy relation.
5. Discuss : Zadeh Extension principle on fuzzy sets
6. Write about the working of a fuzzy controller.
7. Describe the effect of informational fuzzyness in Medical diagnosis.

SECTION B
ANSWER ANY THREE QUESTIONS (3 × 20 = 60)

8. a) Explain the concept of a fuzzy set and types of fuzzy sets.
   b) Write the features that are responsible for the Paradigm shift from the classical set theory.
   c) Show that $^{\alpha}\left(\overline{A}\right) \neq \overline{^{\alpha}A}$.

9. Write a note on any two of : i) fuzzy ordering relations; ii) fuzzy equivalence relation
   iii) fuzzy Morphisms

10. Using standard notations, discuss the fuzzy relation equations based on *inf* and *sup* compositions.

11. Explain in brief the concepts of fuzzy logic using fuzzy Propositions, Fuzzy quantifiers, linguistic hedges and inference from Conditional propositions.

12. Discuss an application of fuzzy set theory to engineering or Industry and Pattern recognition.

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