

**STELLA MARIS COLLEGE (AUTONOMOUS), CHENNAI-86**

**DEPARTMENT OF MATHEMATICS**

**CODE : MT/RO/FT25**

**FUZZY SET THEORY AND APPLICATIONS**

**Class : M.Phil.**

**Max. : 100 Mks.**

**Time : 3 Hrs.**

**Answer any FOUR questions only : (25 × 4 = 100)**

1. a) Define a fuzzy set and  $\alpha$ -cut of a fuzzy set with an example.  
b) Write a note on arithmetic of fuzzy real line.  
c) Explain the different operations of fuzzy real numbers. (5+10+10)
2. Explain the concept of fuzzy t-norms and fuzzy t-conorms and combination of the operations with respect to fuzzy complements.
3. a) Discuss the concept of  $Sup-i$  Compositions of fuzzy relations and  $Inf\pi$ , Compositions of fuzzy relations.  
b) Discuss : Partitioning using Solution method. (15+10)
4. a) State and prove the representation theorems with examples.  
b) Write the details of fuzzy equation w.r.t. addition.  
c) Write a note on Linguistic Hedges. (10+10+5)
5. a) Explain with an instance any two types of Fuzzy propositions.  
b) Explain the role of Fuzzy controllers in a Fuzzy Expert system.  
c) Discuss fuzzy equivalence relation.
6. Discuss in detail with an example any TWO of the following :
  - a) Application of Fuzzy Mathematics to Engineering
  - b) Application of Fuzzy Mathematics to Industry
  - c) Application of Fuzzy Mathematics to Medicine

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