

**B.Tech. – VIEP – COMPUTER SCIENCE AND  
ENGINEERING (BTCSVI)**

**Term-End Examination**

00550

**December, 2017**

**BICSE-004 : FUZZY SYSTEMS**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Answer any seven questions. All questions carry equal marks. Assume missing data, if any.*

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1. (a) What are Crisp Sets ? How do crisp sets differ from fuzzy sets ? Give suitable examples for both. 5
- (b) Write axioms of fuzzy intersection in t-norm. Prove that the standard fuzzy intersection is the only idempotent t-norm. 5
2. (a) Prove that the Max-Min composition and Min join are associative operations on binary fuzzy relations. 5
- (b) Explain the concept of multi-criteria decision-making with the help of a suitable example. 5

3. (a) What are Fuzzy Numbers ? Discuss arithmetic operations on fuzzy numbers, with the help of suitable examples. 5
- (b) Give sup-i compositions of fuzzy relations. Support the submitted sup-i compositions with the help of suitable examples. 5
4. What are Fuzzy Propositions ? How are deductive inferences made through conditional fuzzy propositions ? Discuss with the help of a suitable example. 10
5. (a) What are Fuzzy Quantifiers ? Discuss each fuzzy quantifier with the help of a suitable example. 5
- (b) Briefly discuss the term Cylindric Extensions in context of fuzzy systems. 5
6. Write short notes on any *two* of the following (Give a suitable example for each) : 5+5
- (a) Binary Fuzzy Relations
- (b) Fuzzy Equations
- (c) Fuzzy Measures
7. (a) What are Fuzzy Compatibility Relations ? Give the properties of fuzzy compatibility relations. 5

- (b) How does fuzzy logic strengthen the information retrieval mechanism ? Give a suitable example in support of your answer. 5
8. Give a brief overview of any *two* of the following : 5+5
- (a) Fuzzy Neural Network
  - (b) Fuzzy Automata
  - (c) Fuzzy Dynamic System
9. What are Fuzzy Controllers ? Discuss the various operations performed by a fuzzy controller. Draw a diagram to describe the general scheme of a fuzzy controller. 10
10. Discuss any *two* of the following with the help of suitable examples :  $2 \times 5 = 10$
- (a) Multistage Decision-Making
  - (b) Genetic Algorithms
  - (c) Fuzzy Implications
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