JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Test 1 EXAMINATION- March 2023

PhD 2nd Semester (Department of Mathematics)

COURSE CODE: 17P1WMA112   MAX. MARKS: 15

COURSE NAME: Intuitionistic Fuzzy Set Theory and Similarity Measures

COURSE CREDITS: 3   MAX. TIME: 1 Hr

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Use of scientific calculator is allowed.

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1. Explain the geometrical representation of the Fuzzy sets, intuitionistic fuzzy sets, Pythagorean and picture fuzzy sets in 2D as well as 3D. (3)

2. Let $X = \{a,b,c,d,e\}$. Let the intuitionistic fuzzy sets A and B have the form $\{<x_i, \mu(x_i), v(x_i)>\}$:

   $A = \{<a,0.5,0.3>,<b,0.1,0.7>,<c,1.0,0.0>,<a,0.0,0.0>,<a,0.0,1.0>\}$

   $B = \{<a,0.7,0.1>,<b,0.3,0.2>,<c,0.5,0.5>,<a,0.2,0.2>,<a,1.0,0.0>\}$. (3)

   Find $A \cup B, A \cap B, \overline{A}, A+B, A.B, A@B$.

3. Discuss various norms and metrics over the intuitionistic fuzzy sets with two term approach. Explain with suitable examples. (4)

4. Explain three distance measures between the intuitionistic fuzzy sets in regard of 3-term approach with the help of one example for each. (5)

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