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Homomorphism of an Intuitionistic Fuzzy ℓ-ring Ideals

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Abstract: In this paper the notion of Intuitionistic fuzzy ℓ-ring ideals(left,right) is introduced and some homomorphism of an intuitionstic fuzzy ℓ-ring ideals(left, right) properties of image have been derived.

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Keywords: Fuzzy set, Intuitionisticfuzzy set, Intuitionisticfuzzy subring,Intuitionisticfuzzy sub ℓ-ring, Intuitionisticfuzzy ℓ-ring ideals(left, right),Homomorphism of an Intuitionistic fuzzy ℓ-ring ideal.

1.INTRODUCTION

Zadeh in [23], who was the first reacher initiated the theory of fuzzy sets in 1965. In fuzzy set theory the membership of an element to a fuzzy set is a single value between zero and one. Therefore, a generalization of fuzzy sets was considered by Atanassov 1986 as intuitionistic fuzzy sets which incorporate the degree of membership and non-membership degrees respectively [3]. The concept of defining intuitionistic fuzzy set as generalized fuzzy set is quite interesting and useful in many application areas. [1] N. Ajmal and K.

V. Thomas discussed the lattice of fuzzy ideals of a ring. [4] K. T. Atanassov proved new operations defined over the intuitionstic fuzzy sets. [5] B. Banerjee and D. K. Basnet introduced the concept of intuitionistic fuzzy subring and ideals. [12] K. Hur, H. W. Kang and H. K. song developed the concept of intuitionistic fuzzy subgroups and subrings. Also K. Hur, SY. Jang and HW. Kang Intuitionistic fuzzy ideals of a ring [11]. Further, K. Hur, Y. S. Ahn and D. S. Kim [10] extented the lattice of intuitionistic fuzzy ideals of rings. [14] Marashdeh and salleh they have also introduced and studied the notion of intuitionistic fuzzy rings based on the notion of fuzzy space. K. Meena and K. V. thomas [13] discussed the idea about intuitionistic ℓ-fuzzy subring.

Lattice theory has been applied to all kinds of fields. [17] R. Natarajan and S. Moganavalli applied the concept of fuzzy sets to lattice theory. [15] M. Mullai B. Chellappa have introduced fuzzy ℓ-fliter. [20] Also Double representation for an intuitionistic fuzzy ℓ-filter was introduced by KR. sasireka, KE. Sathappan and B. Chellappa. We also established by the properties of intuitionistic fuzzy sub ℓ-ring. [23] G. J. Wang generalized order-homomorphism on fuzzy. [18] D. M. Olson proved on the homomorphism for hemirings. [19] N. Palaniappan K. Arjunan, introduced and studied the homomorphism, anti-homomorphism of a fuzzy and anti-fuzzy ideals. [7] K. Chandrasekhara rao and V. Swaminathan studied in detail anti-homomorphism in near-rings. In this paper, we define the notion of the intuitionistic fuzzy ℓ-ring ideals(left, right) and have studied Homomorphism of an intuitionistic fuzzy ℓ-ring ideals.

This paper has been organized as follows: In section 2, some preliminary definitions and examples have been outlined. In section 3, the definition of intuitionistic fuzzy ℓ-ring ideals(left, right) is given and few homomorphism images have been analysed.

2.PRELIMINARIES

In this section, we give some basic definitions. There were two definitions for a lattice, one as a poset and the other as an algebraic structure. A poset (L,$\leq$) is said to form a lattice if for any a, b $\in$ L, Sup{a,b} and inf{ a,b} exist in L. In this case we write Sup{a,b} = a$\vee$b and inf{a,b} = a$\wedge$b. Throughout this paper we denote a lattice with join $'\vee'$ and meet $'\wedge'$ by simply L.

Definition 2.1 *[13] Let X be a non-empty. An intuitionistic fuzzy set A of X is an object of the following from* $A = \{\langle X, \mu_A(x), \nu_A(x)\rangle / x \in X\}$, *where* $\mu_A : X \rightarrow [0, 1]$ *and* ν_A: $X \rightarrow [0, 1]$, *define the degree of membership and the degree of non-membership of the element* $x \in X$, *respectively and* $\forall\ x \in X$, $0 \leq \mu_A(x) + \nu_A(x) \leq 1$.

Definition 2.2 *[13] Let L be a lattice and* $A = \{\langle X, \mu_A(x), V_A(x)\rangle / x \in X\}$ *be an intuitionistic fuzzy set of L. Then A is called an intuitionistic fuzzy sublattice(intuitionistic fuzzy lattice) of L if the following conditions are satisfied*

(i) $\mu_A(x \vee y) \geq min\ \{\ \mu_A(x)\ ,\ \mu_A(y)\}$

(ii) $\mu_A(x \wedge y) \geq min\ \{\ \mu_A(x),\ \mu_A(y)\}$

(iii)$\nu_A(x \vee y) \leq max\ \{\ \nu_A(x),\ \nu_A(y)\}$

(iv) $\nu_A(x \wedge y) \leq max\ \{\ \nu_A(x),\ \nu_A(y)\} \quad \forall\ x,\ y \in L$.

Definition 2.3 *[13] An Intuitionistic fuzzy sublattice A of L is called an intuitionistic fuzzy ideal of L (Intuitionistic fuzzy ℓ-ideal) if the following conditions are satisfied.*

(i) $\mu(x \vee y) \geq min \{ \mu(x) , \mu(y)\}$ *(iii)* $\nu(x \vee y) \leq max \{ \nu(x) , \nu(y)\}$
(ii) $\mu(x \wedge y) \geq max \{ \mu(x) , \mu(y)\}$ *(iv)* $\nu(x \wedge y) \leq min \{ \nu(x) , \nu(y)\}$
$\forall$ $x, y \in L$.

Definition 2.4 *[17] A fuzzy subset μ of a lattice ordered ring(or ℓ-ring in short) R, is called fuzzy sub ℓ-ring of R, if the following conditions are satisfied.*
(i) $\mu(x \vee y) \geq min \{ \mu(x) , \mu(y)\}$ *(iii)* $\mu(x - y) \geq min \{ \mu(x) , \mu(y)\}$
(ii) $\mu(x \wedge y) \geq min \{ \mu(x) , \mu(y)\}$ *(iv)* $\mu(xy) \geq min \{ \mu(x) , \mu(y)\}$
for all $x, y \in L$.

Definition 2.5 *[17] A fuzzy subset μ of an ℓ-ring R, is called a fuzzy ℓ-ring ideal (or) fuzzy ℓ-ideals of R, if for all $x, y \in R$ the following conditions are satisfied.*
(i) $\mu(x \vee y) \geq min \{ \mu(x) , \mu(y)\}$ *(iii)* $\mu(x - y) \geq min \{ \mu(x) , \mu(y)\}$
(ii) $\mu(x \wedge y) \geq max \{ \mu(x) , \mu(y)\}$ *(iv)* $\mu(xy) \geq max \{ \mu(x) , \mu(y)\}$
for all $x, y \in L$.

Definition 2.6 *[16] A mapping f from R to a ring S is called an homomorphism, $\forall$ x,y $\in$ R*
(i) $f(x+y) = f(x) + f(y)$
(ii) $f(xy) = f(x) . f(y)$.

Definition 2.7 *[17] Let R and S be two l-rings. A function $f : R \to S$ is called an ℓ-homomorphism if for all $x, y \in R$.*
(i) $f(x \vee y) = f(x) \vee f(y)$
(ii) $f(x \wedge y) = f(x) \wedge f(y)$
(iii) $f(x + y) = f(x) + f(y)$
(iv) $f(xy) = f(x). f(y)$

Definition 2.8 *[16] Let f be a mapping from a set R to a set S and let A be a fuzzy subset in R. Then A is called f-invarient if f(x) = f(y) implies A(x) = A(y) for all x, y ∈ R. Clearly, if A is f-invarient, then* $f^{-1}(f(A)) = A$.

Definition 2.9 *[13] An intuitionistic fuzzy set A is said to have sup-property[inf-property], if for each subset* $T \subseteq A$ *there exist* $t_0 \in T$ *such that,*

$$\sup_{t\in T}; \{\mu(t)\} = \mu(t_o)$$
$$\inf_{t\in T} \{\nu(t)\} = \nu(t_o)$$

Definition 2.10 *[13] Let f be a mapping from a set X to a set Y and let* μ_A *and* ν_A *be intuitionistic fuzzy subset in X and Y respectively.*
(i) f(A), the image of A under f, is a intuitionistic fuzzy subset in Y for all y∈ Y. We define,

$$f(\mu_A)(y) = \begin{cases} \sup_{x\in f^{-1}(y)} \mu_A(x), & \text{if } f^{-1}(y) \neq \phi \\ 0 & \text{if } f^{-1}(y) = \phi \end{cases}$$

and

$$f(\nu_A)(y) = \begin{cases} \inf_{x\in f^{-1}(y)} \nu_A(x), & \text{if } f^{-1}(y) \neq \phi \\ 1 & \text{if } f^{-1}(y) = \phi \end{cases}$$

$f^{-1}(B)$ *is the pre-image of B under f, is a intuitionistic fuzzy set in X.*

$$ie)\ f^{-1}(\mu_A)(x)=\mu_A(f(x)) \quad \text{and}$$

$$f^{-1}(\nu_A)(x)= \nu_A(f(x)), \forall\ x\in R$$

Definition 2.11 *[20] Let R be a ring. An Intuitionistic fuzzy set* $A = \{\langle\ x,\mu(x),\ \nu(x)\ \rangle : x \in R\}$ *of R is said to be intuitionistic fuzzy sub* ℓ*-ring on R if for all x, y ∈ R.*

(i) $\mu(x - y) \geq min\ \{\mu(x)\ ,\ \mu(y)\}$ *(ii)* $\mu(xy) \geq min\ \{\mu(x)\ ,\ \mu(y)\}$

(iii) $\mu(x \vee y) \geq min\ \{\mu(x)\ ,\ \mu(y)\}$ *(iv)* $\mu(x \wedge y) \geq min\ \{\mu(x)\ ,\ \mu(y)\}$

(v) $\nu(x - y) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$ *(vi)* $\nu(xy) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$

(vii) $\nu(x \vee y) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$ *(viii)* $\nu(x \wedge y) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$

Example 2.12 *[17] Now* $(R = a,\ b,\ c,\ d,\ +,\ \cdot,\ \vee,\ \wedge)$ *is an* ℓ*-ring under the operations* $+,\ \cdot,\ \vee,$ *and* $\wedge$ *defined by the following tables,*

+	a	b	c	d
a	a	b	c	d
b	b	a	d	c
c	c	d	a	b
d	d	c	b	a

.	a	b	c	d
a	a	a	a	a
b	a	b	a	b
c	a	a	c	c
d	a	b	c	d

∨	a	b	c	d
a	a	b	c	d
b	b	b	d	d
c	c	d	c	d
d	d	d	d	d

∧	a	b	c	d
a	a	a	a	a
b	a	b	a	b
c	a	a	c	c
d	a	b	c	d

3. Theorems on Intuitionistic fuzzy ℓ-ring ideals.

Definition 2.13 *An intuitionistic fuzzy sub* ℓ*-ring A on R is said to be a intuitionistic fuzzy left* ℓ*-ideal if for all* $x,\ y \in R$.

(i)$\mu(x - y) \geq min\ \{\mu(x),\ \mu(y)\}$ *(ii)*$\mu(xy) \geq \mu(y)$

(iii)$\mu(x \vee y) \geq min\ \{\mu(x)\ ,\ \mu(y)\}$ *(iv)*$\mu(x \wedge y) \geq max\ \{\mu(x)\ ,\ \mu(y)\}$

(v) $\nu(x - y) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$ *(vi)* $\nu(xy) \leq \nu(y)$

(vii)$\nu(x \vee y) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$ *(viii)*$\nu(x \wedge y) \leq min\ \{\nu(x)\ ,\ \nu(y)\}$

Definition 2.14 *An intuitionistic fuzzy sub* ℓ*-ring A on R is said to be a intuitionistic fuzzy right* ℓ*-ideal if for all* $x,\ y \in R$

(i) $\mu(x - y) \geq min\ \{\mu(x)\ ,\ \mu(y)\}$ *(ii)* $\mu(xy) \geq \mu(x)$

(iii) $\mu(x \vee y) \geq min\ \{\mu(x)\ ,\ \mu(y)\}$ *(iv)* $\mu(x \wedge y) \geq max\ \{\mu(x)\ ,\ \mu(y)\}$

(v) $\nu(x - y) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$ (vi)$\nu(xy) \leq \nu(x)$

(vii)$\nu(x \vee y) \leq max\ \{\nu(x)\ ,\ \nu(y)\}$ (viii) $\nu(x \wedge y) \leq min\ \{\nu(x)\ ,\ \nu(y)\}$

Definition 2.15 *An intuitionistic fuzzy sub ℓ-ring A on R is said to be an intuitionistic fuzzy ℓ- ring ideal if it is both an intuitionistic fuzzy left ℓ- ideal and an intuitionistic fuzzy right ℓ- ideal of R.*

Example 2.16 *Consider the Intuitionistic fuzzy ℓ-ring ideal R defined in example 2.10*

$$\mu(x) = \begin{cases} \cdot 9 & if\ x = a \\ \cdot 6 & if\ x = b \\ \cdot 4 & if\ x = c, d. \end{cases}$$

$$\nu(x) = \begin{cases} \cdot 1 & if\ x = a \\ \cdot 3 & if\ x = b \\ \cdot 5 & if\ x = c, d. \end{cases}$$

Remark 2.17 *Every Intuitionistic fuzzy ℓ-ring ideal R is a Intuitionistic fuzzy sub ℓ-ring of R. But converse need not be true.*

Proof: *Consider the intuitionistic fuzzy subset μ, V of ℓ-ring (Z, +, $\cdot$, $\vee$, $\wedge$)*

$$\mu_1(x) = \begin{cases} \cdot 6 & if\ x \in < 2 > \\ \cdot 3 & otherwise \end{cases}$$

$$\nu_1(x) = \begin{cases} \cdot 4 & if\ x \in < 2 > \\ \cdot 7 & otherwise \end{cases}$$

Theorem 2.18 *Let f be a homomorphism from a ℓ-ring R into ℓ-ring S and let μ_A, ν_A be an Intuitionistic fuzzy left ℓ-ideal of S. Then the pre-image $f^{-1}(\mu_A)$ and $f^{-1}(\nu_A)$ is a intuitionistic fuzzy left ℓ-ideal of R.*

Proof: Consider a ℓ-ring homomorphism f : R $\rightarrow$ S

Let μ_A,ν_A be a Intuitionistic fuzzy left ℓ-ideal of S. $\forall$ x, y $\in$ R.

$$\begin{aligned}
(i)f^{-1}(\mu_A)(x-y) &= \mu_A f(x-y)\\
&\geq min\{\mu_A f(x), \mu_A f(y)\}\\
f^{-1}(\mu_A)(x-y) &\geq min\{f^{-1}(\mu_A)(x), f^{-1}(\mu_A)(y))\}.\\
(ii)f^{-1}(\mu_A)(xy) &= \mu_A f(xy)\\
&\geq \mu_A f(y)\\
&\geq f^{-1}(\mu_A(y))\\
f^{-1}(\mu_A)(xy) &\geq f^{-1}(\mu_A(y))\\
(iii)f^{-1}(\mu_A)(x \vee y) &= \mu_A f(x \vee y)\\
&\geq min\{\mu_A f(x), \mu_A f(y)\}\\
&\geq min\{f^{-1}(\mu_A)(x), f^{-1}(\mu_A)(y))\}\\
(iv)f^{-1}(\mu_A)(x \wedge y) &= \mu_A f(x \wedge y)\\
&\geq max\{\mu_A f(x), \mu_A f(y)\}\\
&\geq max\{f^{-1}(\mu_A)(x), f^{-1}(\mu_A)(y))\}\\
(v)f^{-1}(\nu_A)(x-y) &= \nu_A f(x-y)\\
&\leq max\{\nu_A f(x), \nu_A f(y)\}\\
&\leq max\{f^{-1}(\nu_A)(x), f^{-1}(\nu_A)(y))\}\\
(vi)f^{-1}(\nu_A)(xy) &= \nu_A(f(xy))\\
&\leq \nu_A f(y)\\
&\leq f^{-1}(\nu_A(y))\}\\
(vii)f^{-1}(\nu_A)(x \vee y) &= \nu_A f(x \vee y)\\
&\leq max\{\nu_A f(x), \nu_A f(y)\}\\
&\leq max\{f^{-1}(\nu_A)(x), f^{-1}(\nu_A)(y))\}
\end{aligned}$$

$$
\begin{aligned}
(viii) f^{-1}(\nu_A)(x \wedge y) &= \nu_A f(x \wedge y) \\
&\leq min\{\nu_A f(x), \nu_A f(y)\} \\
&\leq min\{f^{-1}(\nu_A)(x), f^{-1}(\nu_A)(y))\}
\end{aligned}
$$

$\therefore$ $f^{-1}(\mu_A)$, $f^{-1}(\nu_A)$ is a intuitionistic fuzzy left ℓ-ideal of R.

Theorem 2.19 *Let f : $R \rightarrow S$ be an homomorphism from ℓ-ring R into S.*
(i) If μ_A, ν_A is a Instuitionistic fuzzy right ℓ-ideal of S , then pre-image $f^{-1}(\mu_A)$, $f^{-1}(\nu_A)$ is a Intuitionistic fuzzy right ℓ-ideal of R.

Proof: Consider a ℓ-ring homomorphism f : R $\rightarrow$ S. Let μ_A, ν_A be a Intuitionistic fuzzy right ℓ-ideal of S, for all x, y $\in$ R.

$$
\begin{aligned}
(i) f^{-1}(\mu_A)(x - y) &= \mu_A f(x - y) \\
&\geq min\{\mu_A f(x), \mu_A f(y)\} \\
f^{-1}(\mu_A)(x - y) &\geq min\{f^{-1}(\mu_A)(x), f^{-1}(\mu_A)(y))\}. \\
(ii) f^{-1}(\mu_A)(xy) &= \mu_A(f(xy)) \\
&\geq \mu_A(f(x)) \\
&= f^{-1}(\mu_A)(x) \\
&\geq f^{-1}((\mu_A)(x)) \\
(iii) f^{-1}(\mu_A)(x \vee y) &= \mu_A f(x \vee y) \\
&\geq min\{\mu_A f(x), \mu_A f(y)\} \\
&\geq min\{f^{-1}(\mu_A)(x), f^{-1}(\mu_A)(y)\} \\
(iv) f^{-1}(\mu_A)(x \wedge y) &= \mu_A(f(x \wedge y)) \\
&\geq max\{\mu_A f(x), \mu_A f(y)\} \\
&\geq max\{f^{-1}\mu_A(x), f^{-1}\mu_A(y))\}
\end{aligned}
$$

$$\begin{aligned}
(v)f^{-1}(\nu_A)(x-y) &= \nu_A f(x-y) \\
&\leq max\{\nu_A f(x), \nu_A f(y)\} \\
&\leq max\{f^{-1}(\nu_A)(x), f^{-1}(\nu_A)(y))\} \\
(vi)f^{-1}(\nu_A)(xy) &= \nu_A(f(xy)) \\
&\leq \nu_A f(x) \\
&\leq f^{-1}(\nu_A)(x))\} \\
(vii)f^{-1}(\nu_A)(x \vee y) &= \nu_A f(x \vee y) \\
&\leq max\{\nu_A f(x), \nu_A f(y)\} \\
&\leq max\{f^{-1}(\nu_A(x)), f^{-1}(\nu_A(y))\}
\end{aligned}$$

$$\begin{aligned}
(viii)f^{-1}(\nu_A)(x \wedge y) &= \nu_A f(x \wedge y) \\
&\leq min\{\nu_A f(x), \nu_A f(y)\} \\
&\leq min\{f^{-1}(\nu_A(x)), f^{-1}(\nu_A(y))\}
\end{aligned}$$

$\therefore$ $f^{-1}(\mu_A)$, $f^{-1}(\nu_A)$ is a Intuitionistic fuzzy right ℓ-ideal of R.

Theorem 2.20 *Let R and S be ℓ-rings and $f: R \to S$ be an homomorphism from ℓ-ring R into S.*
(i) If μ_A, ν_A is a Intuitionistic fuzzy ℓ-ideal of S, then the pre-image $f^{-1}(\mu_A)$, $f^{-1}(\nu_A)$ is a Intuitionistic fuzzy ℓ-ideal of R.

Proof: It's trivial

Theorem 2.21 *Let R and S be ℓ-ring and $f: R \to S$ be an homomorphism from ℓ-ring R into S.*
If μ_A, ν_A is a Intuitionistic fuzzy left ℓ-ideal of a ℓ-ring R with sup property, then the image $f(\mu_A)$, $f(\nu_A)$ is a Intuitionistic fuzzy left ℓ-ideal of a S.

Proof: Consider a ℓ-ring homomorphism f:R $\rightarrow$ S. Let μ_A, ν_A be a Intuitionistic fuzzy left ℓ-ideal of R. For all x, y $\in$ R.

$$\begin{aligned}
(i)f(\mu_A)(f(x)-f(y)) &= f(\mu_A)f(x-y) \\
&\geq min\{\mu_A(x),\mu_A(y)\} \\
&\geq min\{f(\mu_A)(x), f(\mu_A)(y))\}. \\
(ii)f(\mu_A)(f(x)f(y)) &= f(\mu_A)(f(xy)) \\
&\geq \mu_A(y) \\
&= f(\mu_A)f(y) \\
&\geq f(\mu_A)(f(y)) \\
(iii)f(\mu_A)(f(x)\vee f(y)) &= f(\mu_A)f(x\vee y) \\
&\geq min\{\mu_A(x),\mu_A(y)\} \\
&\geq min\{f(\mu_A)(x), f(\mu_A)(y)\} \\
(iv)f(\mu_A)(f(x)\wedge f(y)) &= f(\mu_A)(f(x\wedge y)) \\
&\geq max\{\mu_A(x),\mu_A(y)\} \\
&\geq max\{f(\mu_A)(x), f(\mu_A)(y)\} \\
(v)f(\nu_A)(f(x)-f(y)) &= f(\nu_A)f(x-y) \\
&\leq max\{\nu_A(x),\nu_A(y)\} \\
&\leq max\{f(\nu_A)(x), f(\nu_A)(y)\} \\
(vi)f(\nu_A)(f(x)f(y)) &= f(\nu_A)f(xy) \\
&\leq \nu_A(y) \\
&\leq f(\nu_A)(f(y))\} \\
(vii)f(\nu_A)(f(x)\vee f(y)) &= f(\nu_A)f(x\vee y) \\
&\leq max\{\nu_A(x),\nu_A(y)\} \\
&\leq max\{f(\nu_A)(x), f(\nu_A)(y)\}
\end{aligned}$$

$$\begin{aligned}(viii)f(\nu_A)(f(x) \wedge f(y)) &= f(\nu_A)(f(x \wedge y)) \\ &\leq min\{\nu_A(x), \nu_A(y)\} \\ &\leq min\{f(\nu_A)(x), f(\nu_A)(y)\}\end{aligned}$$

$\therefore$ f(μ_A), f(ν_A) is a Intuitionistic fuzzy left ℓ-ideal of S.

Theorem 2.22 *Let R and S be ℓ-ring and f : R $\rightarrow$ S be an homomorphism from ℓ-ring R into S.*
If μ_A, ν_A is a Intuitionistic fuzzy right ℓ-ideal of R with sup property, then the image f(μ_A), f(ν_A) is a Intuitionistic fuzzy right ℓ-ideal of S.

Proof: Consider a ℓ-ring homomorphism f: R $\rightarrow$ S.
Let μ_A, ν_A a Intuitionistic fuzzy right ℓ-ideal of R. For all x, y $\in$ R.

$$\begin{aligned}(i)f(\mu_A)(f(x) - f(y)) &= f(\mu_A)f(x - y) \\ &\geq min\{\mu_A(x), \mu_A(y)\} \\ &\geq min\{f(\mu_A)(x), f(\mu_A)(y))\}. \\ (ii)f(\mu_A)(f(x)f(y)) &= f(\mu_A)(f(xy)) \\ &\geq \mu_A(x) \\ &= f(\mu_A)f(x) \\ &\geq f(\mu_A)(f(x)) \\ (iii)f(\mu_A)(f(x) \vee f(y)) &= f(\mu_A)f(x \vee y) \\ &\geq min\{\mu_A(x), \mu_A(y)\} \\ &\geq min\{f(\mu_A)(x), f(\mu_A)(y)\} \\ (iv)f(\mu_A)(f(x) \wedge f(y)) &= f(\mu_A)(f(x \wedge y)) \\ &\geq max\{\mu_A(x), \mu_A(y)\} \\ &\geq max\{f(\mu_A)(x), f(\mu_A)(y)\}\end{aligned}$$

$$\begin{aligned}
(v) f(\nu_A)(f(x) - f(y)) &= f(\nu_A) f(x - y) \\
&\leq max\{\nu_A(x), \nu_A(y)\} \\
&\leq max\{f(\nu_A)(x), f(\nu_A)(y)\} \\
(vi) f(\nu_A)(f(x) f(y)) &= f(\nu_A) f(xy) \\
&\leq \nu_A(x) \\
&\leq f(\nu_A)(f(x))\} \\
(vii) f(\nu_A)(f(x) \vee f(y)) &= f(\nu_A) f(x \vee y) \\
&\leq max\{\nu_A(x), \nu_A(y)\} \\
&\leq max\{f(\nu_A)(x), f(\nu_A)(y)\} \\
(viii) f(\nu_A)(f(x) \wedge f(y)) &= f(\nu_A)(f(x \wedge y)) \\
&\leq min\{\nu_A(x), \nu_A(y)\} \\
&\leq min\{f(\nu_A)(x), f(\nu_A)(y)\}
\end{aligned}$$

$\therefore$ f(μ_A), f(ν_A) is a intuitionistic fuzzy right ℓ-ideals of S.

Theorem 2.23 *Let R and S be a ℓ-ring and f: $R \to S$ be an homomorphism from ℓ-ring R into S.*
If μ_A, ν_A is an Intuitionistic fuzzy l-ideal of a ℓ-ring R with sup property, then the image f(μ_A), f(ν_A) is a fuzzy ℓ-ideal of S.

Proof: It's trivial.

4.CONCLUSION

In this paper,the concept of Homomorphism on Intuitionistic fuzzy l-ring ideal of images are introduced. To extend this work, one can investigate the other anti-homomorphism properties.

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