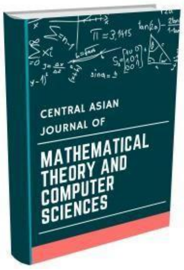

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Article

Some Properties of Fuzzy Ideals of Semi-Weakly m -Regular LA Semi Group

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Abstract: In this work we present the Some properties fuzzy ideals for the semi-weakly m regular for a LA semi-group as well as some important results are studying such as If ϖ is a fuzzy-interior ideal in Semi-weakly m regular LAsemi-g $\mathcal{F}$, with identity, then $\varpi(\alpha^m \mathfrak{f}^m) = \varpi(\mathfrak{f}^m \alpha^m)$ forall $\alpha, \mathfrak{f} \epsilon \mathcal{F}$, m is a constant and A fuzzy-subset ϖ of Semi-weakly m regular LAsemi-g $\mathcal{F}$ with left identity be the fuzzy-left ideals in $\mathcal{F}$ iff it is the fuzzy-right ideals for the $\mathcal{F}$. Many properties and examples for a fuzzy-ideals(right, left, two sided, quasi, interior, bi-generalized-bi, and (1, 2)) of Semi-weakly m regular of LA semi-group were shown.

Keywords: LA semi-group, semi-weakly m regular, fuzzy-two sided ideal, fuzzy- interior ideal.

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1. Introduction

In (2012) Zubayda M I, Maha F K interduced the concepted m regular semi-group $\mathcal{F}$ which is $u \,\epsilon \mathcal{F}$, there exists $v \epsilon \mathcal{F}$, s.t $u^m = u^m v\, u^m$, where m is constant[1].

The concept of S weakly regular semi-groups was first introduced by Akram, S. M, Which is $u \,\epsilon \mathcal{F}$, there exists $v, w \epsilon \mathcal{F}$, s.t $u = u\, v\, u^2 w$ [2].

In this paper we have extended the concept of Semi-weakly m regular LAsemi-group $\mathcal{F}$ which is $u \,\epsilon \mathcal{F}$, there exists $v, w \epsilon \mathcal{F}$, s.t $u^m = u^m v\, u^{2m} w$, where m is constant]. They named it as a left almost semi-group (LAsemi-g).

An LAsemi-g be the groupoid $\mathcal{F}$ whose elements a left invertive laws (uv)w= (wv) u forall $u, v, w \epsilon \mathcal{F}$[3].

In an LAsemi-g the medial's laws (uv) (wz) = (uw)(vz) forall u, v, w, $z \epsilon \mathcal{F}$ [3].

An LAsemi-g may or may not includes the left identities.

An LAsemi-g with left identity the paramedical laws (uv) (wz) = (z w)(vu) hold, [3]. If an LAsemi-g includes the left identity, so by use medial laws, implies that u(vw) =v(uw) [3].

The fuzzy-subsets ϖ in the semi-g $\mathcal{F}$ be named fuzzy-sub semi-g for the $\mathcal{F}$ if ϖ (uv) $\geqslant$ min $\{\varpi(u), \varpi(v)\}$[4].

The fuzzy sub semi-g ϖ in the semi-g $\mathcal{F}$ named fuzzy-interior ideals for the $\mathcal{F}$ where $\varpi(uvw) \geqslant \varpi(v)$ [5].

If ϖ fuzzy-left ideal, fuzzy-right ideals for the $\mathcal{F}$, so ϖ be the fuzzy-ideals for the $\mathcal{F}$

[6].

If $\mathcal{F}$ is the order semi-g, the fuzzy-subsemi-g ϖ for the $\mathcal{F}$ is fuzzy-left (resp, right)ideals for the $\mathcal{F}$ if 1- $g \preccurlyeq \alpha \Longrightarrow \varpi(g) \succcurlyeq \varpi(\alpha)$ 2- $\varpi(g\alpha) \succcurlyeq \varpi(\alpha)$, $(\varpi(g\alpha) \succcurlyeq \varpi(g))$ forall $g, \alpha \in \mathcal{F}$ [6].

Let $\mathcal{F}$ is ordered semi-g, the fuzzy-subsemi-g ϖ for the $\mathcal{F}$ be the fuzzy-bi ideals for the $\mathcal{F}$ where 1- $g \preccurlyeq \alpha \Longrightarrow \varpi(g) \succcurlyeq \varpi(\alpha)$ 2- $\varpi(g\alpha w) \succcurlyeq \min\{\varpi(g), \varpi(w)\}$ forall $g, \alpha, w \in \mathcal{F}$ [7].

If ϖ is both a fuzzy left-ideal & right ideals for the $\mathcal{F}$ so ϖ be the fuzzy two sided ideals for the $\mathcal{F}$ [7].

The fuzzy-subsemi-g ϖ for the LAsemi-g $\mathcal{F}$ is said to be fuzzy-(1, 2) ideal of $\mathcal{F}$ if $\varpi((g)(\alpha w)) \succcurlyeq \varpi(g) \wedge \varpi(\alpha) \wedge \varpi(w)\}$ forall $g, \alpha, w \in \mathcal{F}$ [7].

The fuzzy subsets ϖ for the LAsemi-g $\mathcal{F}$ is named fuzzy-quasi ideals for the $\mathcal{F}$ where $(\varpi \circ K_{\mathcal{F}}) \cap (K_{\mathcal{F}} \circ \varpi) \subseteq \varpi$[7].

For an ordered semi-g $\mathcal{F}$ the fuzzy-subsets 0 &1 in the $\mathcal{F}$ define

$0 : \mathcal{F} \longrightarrow [0, 1] \mid x \longrightarrow 0(x) = 0$,

$1 : \mathcal{F} \longrightarrow [0, 1] \mid x \longrightarrow 1(x) = 1$,

so it is clear a fuzzy-subset 0 of $\mathcal{F}$ be least elements for the sets (K($\mathcal{F}$), ≼) that is $\varpi \circ 0 = 0 \circ \varpi = 0$) [8].

the product $\varpi \circ \rho$ is defined by:

$$(\varpi \circ \rho)_{(u^m)} = \begin{cases} \bigvee_{u^m = u^m v\, u^{2m} w} \{\varpi(u^m v) \wedge \rho(u^{2m} w)\}; \text{forsome } v, w \in \mathcal{F}, \text{s.t } u^m = u^m v\, u^{2m} w \\ 0; \quad otherwise. \end{cases}$$ [9].

2. Materials and Methods

Definition (1. 1)

A semi-g $\mathcal{F}$ is called Semi-weakly m regular if forall $\tau \in \mathcal{F}$ there exists $v, w \in \mathcal{F}$ s.t $\tau^m = \tau^m v\, \tau^{2m} w$, where m is constant.

Example (1. 2)

Let $\mathcal{F} = \{\tau, v, \beta, s, t\}$ be LAsemi-g with left identity s with multiplication taple.

.	τ	v	β	s	t
τ	τ	τ	τ	τ	τ
v	τ	v	v	v	v
β	τ	v	s	t	β
s	τ	v	β	s	t
t	τ	v	t	β	s

$\mathcal{F}$ is Semi-weakly m_regular because $\tau^3 = \tau^3\, v\, \tau^6 \beta$,

$v^3 = v^3\, \beta\, v^6 s$,

$\beta^3 = \beta^3\, t\, v^6 s$,

$s^3 = s^3\, \beta\, s^6 t$,

$t^3 = t^3\, s\, t^6 \beta$, where m=3.

Example (1. 3)

Let $\mathcal{F}$ ={τ, υ, w, s, t} be LAsemi-g with left identity s with multiplication taple.

.	τ	υ	w	s	t
τ	τ	u	τ	τ	τ
υ	τ	t	t	w	t
w	τ	t	t	υ	t
s	τ	υ	w	s	t
t	τ	t	t	t	t

Note that $\mathcal{F}$ is not Semi-weakly m regular for $\upsilon \epsilon \mathcal{F}$,
there does not exists $x, y \epsilon \mathcal{F}$, s.t υ^m=$\upsilon^m \ x \ \upsilon^{2m} \ y$.

Remark (1. 4)

If ϖ is a fuzzy subset of a ALsemi-g $\mathcal{F}$ with left identity then $\mathcal{F}$ is Semi-weakly m regular if $\varpi(\mathrm{u}^{\mathrm{m}}) = \varpi(\mathrm{u}^{2\mathrm{m}})$ holds forall uϵ $\mathcal{F}$,
while the opposite not true.

Example (1. 5)

Let $\mathcal{F}$ ={$\mathfrak{g}, \mathcal{g}, w, s, t$} be an LAsemi-g with left identity s with multiplication taple.

.	$\mathfrak{g}$	$\mathcal{g}$	w	s	t
$\mathfrak{g}$	$\mathfrak{g}$	$\mathfrak{g}$	$\mathfrak{g}$	$\mathfrak{g}$	$\mathfrak{g}$
$\mathcal{g}$	$\mathfrak{g}$	$\mathcal{g}$	$\mathcal{g}$	$\mathcal{g}$	$\mathcal{g}$
w	$\mathfrak{g}$	$\mathcal{g}$	w	s	t
s	$\mathfrak{g}$	$\mathcal{g}$	t	w	s
t	$\mathfrak{g}$	$\mathcal{g}$	s	t	w

Let us consider a Semi-weakly m regular LAsemi-g $\mathcal{F}$ in example defined the fuzzy-subsets ϖ for the $\mathcal{F}$ by:

$\varpi(\mathfrak{g})$= 0.6, $\varpi(\mathcal{g})$= 0.2 and
$\varpi(w)$= $\varpi(s)$= $\varpi(t)$= 0.9.
then it is easy to see that
$\varpi(\mathfrak{g}^m) \neq \varpi(\mathfrak{g}^{2m})$ for $\mathfrak{g} \epsilon \mathcal{F}$, where m is constant.

Proposition (1. 6)

If ϖ is a fuzzy-interior ideal in Semi-weakly m regular LAsemi-g $\mathcal{F}$, with identity, then $\varpi(\alpha^m \ \mathfrak{f}^m) = \varpi(\mathfrak{f}^m \alpha^m)$ forall $\alpha, \mathfrak{f} \epsilon \mathcal{F}$, m is a constant.

Proof

$\Rightarrow$ ϖ be the fuzzy-interior ideals for the Semi-weakly m regular LAsemi-g $\mathcal{F}$, if $\alpha \ \epsilon \mathcal{F}$ so $\exists$ $d, \tau \epsilon \mathcal{F}$, s.t

$\alpha^m = \alpha^m d \ \alpha^{2\mathrm{m}} \ \tau$, where m is constant.

$\varpi(\alpha^{\mathrm{m}}) = \varpi(\alpha^{\mathrm{m}} d \ \alpha^{2\mathrm{m}} \ \tau)$

$=\varpi((\alpha^{m}d)\alpha^{2m}\tau)$

$=\varpi(s\,\alpha^{2m}\tau)$, where $s=(\alpha^{m}d)$

$\geqslant \varpi(\alpha^{2m})$ [because ϖ is a fuzzy-interior ideal]

$\varpi(\alpha^{2m})=\varpi(\alpha^{m}\alpha^{m})$

$=\varpi(\alpha^{m}\alpha^{m}d\,\alpha^{2m}\,\tau)$

$=\varpi((\alpha^{2m}d)\,\alpha^{m}(\alpha^{m}\tau))$

$=\varpi((s)\,\alpha^{m}(t))$

where $s=(\alpha^{2m}d)$ and $t=(\alpha^{m}\tau)$

$\geqslant \varpi(\alpha^{m})$ [because ϖ is a fuzzy-interior ideal].

Therefor $\varpi(\alpha^{m})=\varpi(\alpha^{2m})$

$\varpi(\alpha^{m}f^{m})=\varpi((\alpha^{m}f^{m})^{2})$

$=\varpi((\alpha^{m}f^{m})(\alpha^{m}f^{m}))$ [by the paramedial law[3])

$=\varpi((f^{m}\alpha^{m})(f^{m}\alpha^{m}))=\varpi(e(f^{m}\alpha^{m})(f^{m}\alpha^{m}))$

$\geqslant \varpi((f^{m}\alpha^{m}))$ [because ϖ is a fuzzy-interior ideal]

Hence $\varpi(\alpha^{m}f^{m})\geqslant \varpi(f^{m}\alpha^{m})\ldots 1$

$\varpi(f^{m}\alpha^{m})=\varpi(f^{m}\alpha^{m}d\,\alpha^{2m}\tau)$

$=\varpi(f^{m}[\alpha^{m})\,d\,\alpha^{2m}\tau])$ [by using medial law [3])

$=\varpi(\alpha^{m}(\,f^{m}\,d\,\alpha^{2m}\tau))$

$=\varpi(\alpha^{m}\;f^{m}\,d\,\alpha^{2m}\tau)$

$=\varpi(\,e(\alpha^{m}\;f^{m})(d\,\alpha^{2m}\tau))$

$\geqslant \varpi((\alpha^{m}\;f^{m}))$

$\varpi(f^{m}\alpha^{m})\;\geqslant \varpi(\alpha^{m}f^{m}\quad)\ldots 2$,

hence from 1 and 2 we get

$\varpi(\alpha^{m}\;f^{m})=\varpi(f^{m}\,\alpha^{m})$ [11].

Proposition (1.7)

For a fuzzy-subset ϖ of Semi-weakly m regular LAsemi-g $\mathcal{F}$ and K is a subset of $\mathcal{F}$, then $(K_{\mathcal{F}}\circ\varpi)=\varpi$.

Proof

Since $\mathcal{F}$ is Semi-weakly m regular LAsemi-g

therefore, forall $g\epsilon\mathcal{F}\;\exists\;\alpha, f\epsilon\mathcal{F}$, s.t $g^{m}=g^{m}\alpha\,g^{2m}f$, where m is constant.

$g^{m}=g^{m}\alpha\,g^{2m}f$

$=(g^{m}(\alpha\,g^{2m}))f$ [by the left invertive law[3]]

$=(f(\alpha\,g^{2m}))g^{m}$

$(K_{\mathcal{F}}(\alpha)\circ\varpi)_{(g^{m})}=\bigvee_{g^{m}=(f(\alpha\,g^{2m}))g^{m}}\{K_{\mathcal{F}}(\alpha)((f(\alpha\,v^{2m}))\wedge\varpi(g^{m})$

$=\bigvee_{g^{m}=(f(\alpha\,g^{2m}))g^{m}}\{1\wedge\varpi(g^{m})=\varpi(g^{m})$.

Hence $(K_{\mathcal{F}}\circ\varpi)=\varpi$

Proposition(1. 8)

In Semi-weakly m regular semi-g $\mathcal{F}$, $(K_{\mathcal{F}}(\alpha)\circ\varpi)=\varpi$ and $(\varpi\circ K_{\mathcal{F}}(\alpha))=\varpi$ holds forevery fuzzy-two sided ideal ϖ of $\mathcal{F}$.

Proof

Since $\mathcal{F}$ is Semi-weakly m regular LAsemi-g therefore forall $g\epsilon\mathcal{F}\;\exists\;\alpha, f\epsilon\mathcal{F}$, s.t $g^{m}=g^{m}\alpha\,g^{2m}f$, where m is constant.

$g^{m}=g^{m}\alpha\,g^{2m}f$

$=(g^{m}(\alpha\,g^{2m}))w$ [by the left invertive law [3]]

$=(f(\alpha\,g^{2m}))g^{m}$

$=((f\alpha\,g^{m})g^{m})g^{m}$

$(\varpi\circ K_{\mathcal{F}}(\alpha))_{(g^{m})}=\bigvee_{g^{m}=((f\alpha\,g^{m})g^{m})g^{m}}\{\varpi((f\,\alpha\,g^{m})g^{m})\wedge K_{\mathcal{F}}(\alpha)(g^{m})$

$\geqslant\varpi(g^{m})\wedge K_{\mathcal{F}}(\alpha)(g^{m})$

$\geqslant\varpi(g^{m})\wedge 1$

$=\varpi(g^{m})$

$\varpi\circ K_{\mathcal{F}}(\alpha)\geqslant\varpi$ and

$\varpi\circ K_{\mathcal{F}}(\alpha)\leqslant\varpi$ [because ϖ is fuzzy-two sided ideal of $\mathcal{F}$]

Therefore $(\varpi\circ K_{\mathcal{F}}(\alpha))=\varpi$.

Corollary (1. 9)

In Semi-weakly m regular LAsemi-g $\mathcal{F}$, $(K_{\mathcal{F}}(\alpha) \circ K_{\mathcal{F}}(\alpha)) = K_{\mathcal{F}}(\alpha)$.

Proposition(1. 10)

A fuzzy-subset ϖ of Semi-weakly m regular LAsemi-g $\mathcal{F}$ with left identity be the fuzzy-left ideals in $\mathcal{F}$ iff it is the fuzzy-right ideals for the $\mathcal{F}$ [12], [13].

proof

$\Rightarrow$ let $g_1, g_2 \epsilon \mathcal{F}$ forsome $\alpha_1, \alpha_2, \mathfrak{f}_1$ and $\mathfrak{f}_2 \epsilon \mathcal{F}$

s.t $g_1{}^m = g_1{}^m \alpha_1\, g_1{}^{2m} \mathfrak{f}_1$ and

$g_2{}^m = g_2{}^m \alpha_2\, g_2{}^{2m} \mathfrak{f}_2$, where m is constant.

$g_1{}^m\, g_2{}^m = g_1{}^m \alpha_1\, g_1{}^{2m}\ \mathfrak{f}_1\, g_2{}^m$

$= (g_1{}^m(\alpha_1\, g_1{}^{2m}\ \mathfrak{f}_1))\, g_2{}^m$ [by the left invertive law[3]]

$= (g_2{}^m(\alpha_1\, g_1{}^{2m}\ \mathfrak{f}_1))\, g_1{}^m$.

$\varpi\,(g_1{}^m g_2{}^m) = \varpi\,((g_2{}^m(\alpha_1\, g_1{}^{2m}\mathfrak{f}_1))\, g_1{}^m)$

$\geqslant \varpi\,(g_1{}^m)$ [because ϖ is fuzzy-left ideal]

$\varpi\,(g_1{}^m\, g_2{}^m) \geqslant \varpi\,(g_1{}^m)$,

hence ϖ is fuzzy-right ideals.

$\Leftarrow$ Let ϖ is a fuzzy-right ideals for the

Semi-weakly m regular LAsemi-g $\mathcal{F}$ with left identity,

$g_1{}^m\, g_2{}^m = g_1{}^m \alpha_1\, g_1{}^{2m}\ \mathfrak{f}_1\, g_2{}^m$

$= (g_1{}^m(\alpha_1\, g_1{}^{2m}\ \mathfrak{f}_1))\, g_2{}^m$ [by the left invertive law[3]]

$= (g_2{}^m(\alpha_1\, g_1{}^{2m}\ \mathfrak{f}_1))\, g_1{}^m$.

$\varpi\,(g_1{}^m\, g_2{}^m) = \varpi\,((g_2{}^m(\alpha_1\, g_1{}^{2m}\mathfrak{f}_1))\, g_1{}^m)$

$\geqslant \varpi\,(g_2{}^m)$ [because ϖ is fuzzy-right ideal]

$\varpi\,(g_1{}^m\, g_2{}^m) \geqslant \varpi\,(g_2{}^m)$.

Hence ϖ is fuzzy-left ideal.

Proposition(1. 11)

If fuzzy-subset ϖ of Semi-weakly m regular LAsemi-gr $\mathcal{F}$ with left identity then ϖ is fuzzy-(1,2) ideals for the $\mathcal{F}$ iff it is fuzzy-two side ideals for the $\mathcal{F}$.

proof

$\Rightarrow$ assume ϖ be fuzzy-(1, 2) ideals for the Semi-weakly m regular LAsemi-g $\mathcal{F}$ and let $u, z \epsilon \mathcal{F}$ for some $v, w \epsilon \mathcal{F}$ s.t

$u^m = u^m v\, u^{2m} w$, where m is constant.

$z\, u^m = z\, u^m v\, u^{2m} w$

$= ((z\, u^m) v\, u^{2m} w\,)$ so we have:

$= u^m(z\, v\, u^{2m} w\,)$ [by the medial law [3]]

$= u^m((z\, u^{2m})(vw))$

$= u^m(u^{2m}\ (z\, vw)\,)$ [by the left invertive law[3]]

$= u^m(\,(vw\, z)\, u^{2m})$ [by the left invertive law[3]]

$\varpi\,(\,z u_1{}^m) = \varpi\,(u^m(\,(vw\, z) u^{2m}))$

$= \varpi\,(u^m(\,(vw\, z) u^m\, u^m))$

$\geqslant \varpi\,(u^m) \wedge \varpi\,(u^m) \wedge \varpi\,(u^m)$ [because ϖ is a fuzzy-(1, 2) ideal]

$\varpi\,(z\, u^m) \geqslant \varpi\,(u^m)$,

then ϖ is fuzzy-left ideal and by proposition (1. 10) ϖ is fuzzy right ideals for the $\mathcal{F}$.

$\Leftarrow$ Let ϖ be the fuzzy two side ideals for

the $\mathcal{F}$ Semi-weakly m regular LAsemi-g, with left identity, and

let u_1, u_2, u_3 and $z \epsilon \mathcal{F}$.

$\varpi(u_1{}^m\, z)(\, u_2{}^m u_3{}^m) \geqslant \varpi\,(u_1{}^m\, z)$ [because ϖ is fuzzy-right ideal]

$\geqslant \varpi\,(u_1{}^m)$ [because ϖ is fuzzy-right ideal]

$\varpi(u_1{}^m\, z)(\, u_2{}^m u_3{}^m) \geqslant \varpi\,(u_2{}^m u_3{}^m)$ [because ϖ is fuzzy-left ideal]

$\geqslant \varpi\,(u_2{}^m)$ [because ϖ is fuzzy-right ideal]

$\varpi(u_1{}^m\, z)(\, u_2{}^m u_3{}^m) \geqslant \varpi\,(u_2{}^m u_3{}^m)$ [because ϖ is fuzzy-left ideal]

$\geqslant \varpi\,(u_3{}^m)$ [because ϖ is fuzzy-left ideal]

$\varpi(u_1{}^m\, z)(\, u_2{}^m u_3{}^m) \geqslant \varpi\,(u_1{}^m) \wedge \varpi\,(u_2{}^m) \wedge \varpi\,(u_3{}^m)$

This shown ϖ be the fuzzy-(1,2) ideals

Proposition(1. 12)

In Semi-weakly m regular LAsemi-g $\mathcal{F}$ with left identity then ϖ be the fuzzy (1,2) ideals for the $\mathcal{F}$ iff ϖ be the fuzzy quasi ideals for the $\mathcal{F}$ [14].

proof

⟹ by proposition (1. 11) and proposition (1. 8) is an easy consequence.

⟸ Let ϖ be the fuzzy-quasi ideals for the Semi-weakly m regulars LAsemi-g $\mathcal{F}$, with the left identities ,

assume that $u \epsilon \mathcal{F}$ for some $v, w \epsilon \mathcal{F}$ s.t $u^m = u^m v\, u^{2m} w$, where m is constant.

$u^m = u^m v\, u^{2m} w$

$= u^m [(v\, u^{2m}) we)]$ [the left invertive law[3]]

$= u^m\, [e\, w(v\, u^m u^m)$

$(\varpi \circ K_{\mathcal{F}})_{(u^m)} = \vee_{u^m = u^m\, [e\, w(v\, u^m u^m)}\{\varpi(u^m) \wedge K_{\mathcal{F}}(v)(e\, w\, v\, u^m u^m)$

$\geqslant \varpi(u^m) \wedge 1$

$= \varpi(u^m)$

Now, by using proposition (1. 7) we get

$(K_{\mathcal{F}} \circ \varpi) = \varpi$ and corollary (1,9) we get

$(K_{\mathcal{F}} \circ K_{\mathcal{F}}) = K_{\mathcal{F}}$.

Therefore $(\varpi \circ K_{\mathcal{F}}) = (K_{\mathcal{F}} \circ \varpi) \circ (K_{\mathcal{F}} \circ K_{\mathcal{F}}) \circ (\varpi \circ K_{\mathcal{F}})$

$= (K_{\mathcal{F}} \circ K_{\mathcal{F}}) \circ (\varpi \circ K_{\mathcal{F}})$

$= (K_{\mathcal{F}} \circ (\varpi \circ K_{\mathcal{F}}) \supseteq (K_{\mathcal{F}} \circ \varpi)$.

Hence $(K_{\mathcal{F}} \circ \varpi) \subseteq (K_{\mathcal{F}} \circ \varpi) \cap (\varpi \circ K_{\mathcal{F}})$.

As ϖ is a fuzzy-quasi ideal of $\mathcal{F}$, $(K_{\mathcal{F}} \circ \varpi) \subseteq \varpi$.

Now lemma(1. 2. 9)[10] and proposition (1. 11),

then we get ϖ be the fuzzy two side ideals and from proposition (1. 11),

we get ϖ is a fuzzy-(1, 2) ideal [15].

3. Conclusion

A semi-g $\mathcal{F}$ is called Semi-weakly m regular if forall $\tau\ \epsilon \mathcal{F}$ there exists $v, w \epsilon \mathcal{F}$ s.t $\tau^m = \tau^m v\, \tau^{2m} w$, where m is constant.

We concluded that:

1. If ϖ is a fuzzy-interior ideal in Semi-weakly m regular LAsemi-g $\mathcal{F}$, with identity, then $\varpi(\alpha^m\, \mathfrak{f}^m) = \varpi(\mathfrak{f}^m \alpha^m)$ forall $\alpha, \mathfrak{f} \epsilon \mathcal{F}$, m is a constant.
2. For a fuzzy-subset ϖ of Semi-weakly m regular LAsemi-g $\mathcal{F}$ and K is a subset of $\mathcal{F}$, then $(K_{\mathcal{F}} \circ \varpi) = \varpi$.
3. In Semi-weakly m regular semi-g $\mathcal{F}$, $(K_{\mathcal{F}}(\alpha) \circ \varpi) = \varpi$ and $(\varpi\ \circ\ K_{\mathcal{F}}(\alpha)) = \varpi$ holds forevery fuzzy two side ideals ϖ in $\mathcal{F}$.
4. The fuzzy-subset ϖ of Semi-weakly m regular LAsemi-g $\mathcal{F}$ with left identity be the fuzzy-left ideals in $\mathcal{F}$ iff it is the fuzzy-right ideals for the $\mathcal{F}$.
5. In Semi-weakly m regular LAsemi-g $\mathcal{F}$ with left identity then ϖ be the fuzzy (1,2) ideals for the $\mathcal{F}$ iff ϖ be the fuzzy quasi ideals for the $\mathcal{F}$.

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