International Journal of Recent Technology and Engineering (IJRTE)
ISSN: 2277-3878, Volume-8 Issue-1S3, June 2019

Soft Ternary Γ-Semirings-II

B. Ravi Kumar, D. Madhusudhana Rao, T. Satish, B. Sankara Rao, M. Vasantha

Abstract**: *In this paper we are introducing the terms of soft quasi T Γ -ideal(SQTΓI), soft bi- T Γ -ideal(SBTΓI) are introduced. It is proved that (1) A soft set (q, P_1, Γ) over a ternary Γ-semiring(TΓ-SR) T is a SQTΓI over T iff ∀ a ∈ P_1, q(a) ≠ ∅ is a quasi-ideal of T. Further many more properties are proved and some examples are given..***

Index Terms**: *TΓ-SR, STΓ-SR, STΓI, SQTΓI.***

I. INTRODUCTION

Molodtsov introduced the new tool as soft set dealing with uncertainties. D. Madhusudhana Rao and Sajani Lavanya introduced the concept of TΓ-SR. Further that Madhu sudhana Rao and Revathi developed the TΓ-SR in terms fuzzy structures. Here, we introduced the concept of soft structures in TΓ-SR.

II. PRELIMINARIES

For preliminaries go through the references

III. SOFT SETS

Let an initial universe denoted by U as well as parameters set by E. Let the power set of *U is P* (*U*), ∅≠*K*⊆*E,*A pair (*q*, *K*) is known as a soft set over *U*, where the mapping *q is* given by *q*:*K*⟶*P* (*U*) . For ξ ∈ K, the set of ξ-approximate elements of the soft set (*q*, *K*) is expressed as *q*(*ξ* Let (*q*, *K*), (r, *L*) be two soft sets over *U*. Then (i) (*q*, *K*) join (*r*, *L*) as (*q*, *K*) ⋁(*r*, *L*) is a soft set as (*s*, *K*×*L*) = (*q*, *K*)⋁(*r*, *L*), where *s*(p_1, p_2) = *q*(p_1) ⋃*r*(p_2) ∀ (p_1, p_2) ∈K × L. (ii) (*q*, *K*) AND (*r*, *L*) as (*q*, *K*) ⋀(*r*, *L*) is a soft set as (*s*, *K*×*L*) = (*q*, *K*)⋀(*r*, *L*), where *s*(p_1, p_2) = *q*(p_1) ⋂*r*(p_2) ∀ (p_1, p_2) ∈K × L. Let (*q*, *K*), (r, *L*) be two soft sets over *U*. Then (1) the extended ⋃ of two soft sets (*q*, *K*), (*r*, *L*) over *U* is the soft set (*s*, *M*), where *M*= *K*⋃*L*, ∀*v* ∈*M*,

$$s(v)=\begin{cases} q(v) \text{ if } v\in K-L \\ r(v) \text{ if } v\in L-K \\ q(v)\bigcup r(v) \text{ if } v\in K\bigcap L. \end{cases}$$

We write (*q*, K) $\cup_E$ (*r*, L) = (*s*, M). (2) The restricted ∪ of two soft sets (*q*, K), (*r*, L) as (*q*, K) $\cup_R$ (*r*, L) and as (*q*, K) $\cup_R$ (*r*, L) = (*s*, M) where M = K⋂ L, ∀ m ∈ M *s*(*m*) = *q*(m) ⋃*r*(m).

(3) The extended ∩ of two soft sets (*q*, *K*), (*r*, *L*) over *U* is the soft set (*s*, *M*), where *M*= *K*⋃*L*, ∀*v* ∈*M*,

$$s(v)=\begin{cases} q(v) \text{ if } v\in K-L \\ r(v) \text{ if } v\in L-K \\ q(v)\bigcap r(v) \text{ if } v\in K\bigcap L. \end{cases}$$

We write (*q*, K) $\cap_E$ (*r*, L) = (*s*, M). (4) The restricted ∩ of two soft sets (*q*, K), (*r*, L) as (*q*, K) $\cap_R$ (*r*, L) as (*q*, K) $\cap_R$ (*r*, L) = (*s*, M) where M = K⋂ L, ∀*v*∈M*s*(*v*) = *q*(*v*) ⋂*r*(*v*).

For more preliminaries one can go through the references.

IV. SOFT QUASI-TΓ-IDEAL

Def 4.1: A soft set (*u*, V_1, Γ) over a TΓ-SR T is known as a ***SQTΓI*** over *T* if (1) (*u*, V_1, Γ)o(*q*, *H*, Γ)o(*q*, *H*, Γ) $\bigcap_R$ (*q*, *H*, Γ)*o*(*u*, V_1, Γ)*o*(*q*, *H*, Γ)$\bigcap_R$ (*q*, *H*, Γ)o (*q*, *H*, Γ)*o*(*u*, V_1, Γ) ⊆ (*u*, V_1, Γ).

(2) (*u*, V_1, Γ)o(*q*, *H*, Γ)o(*q*, *H*, Γ)$\bigcap_R$ (*q*, *H*, Γ)o(*q*, *H*, Γ)*o*(*u*, V_1, Γ)*o*(*q*, *H*, Γ)o(*q*, *H*, Γ)$\bigcap_R$ (*q*, *H*, Γ)o(*q*, *H*, Γ *o*(*u*, V_1, Γ) ⊆ (*u*, V_1, Γ), where (*q*, *H*, Γ) is the absolute soft set over *T*.

Th 4.2: A soft set (*u*, V_1, Γ) over a TΓ-SR T is a *SQTΓI* over T iff ∀ h_1 ∈ V_1, *u*(v_1) ≠ ∅ is a quasi-tΓ-ideal of T.

Proof: If a soft set (*u*, V_1, Γ) over *T* is a SQTΓI over *T*. We show that *u*(v_1) is a quasi-tΓ-ideal of *T*. By definition of restricted product,

(*u*, V_1, Γ)o(*q*, *H*, Γ)o(*q*, *H*, Γ) = (*g*, V_1 ⋂ H⋂ H, Γ) = (*g*, V_1, Γ) →(1)

(*q*, *H*, Γ)*o*(*u*, V_1, Γ)*o*(*q*, *H*, Γ) = (*h*, *H*⋂ V_1⋂ H, Γ) = (*h*, V_1, Γ) →(2)

(*q*, *H*, Γ)o(*q*, *H*, Γ)o(*u*, V_1, Γ) = (*i*, H⋂ H⋂ V_1, Γ) = (*i*, V_1, Γ) →(3)

(*q*, *H*, Γ)*o*(*q*, *H*, Γ)*o*(*u*, V_1, Γ)*o*(*q*, *H*, Γ) *o*(*q*, *H*, Γ) = (H, *H*⋂ *H*⋂ V_1⋂ H⋂ H, Γ) = (H, V_1, Γ) →(4)

From equation (1), (2) and (3) we can write

(*u*, V_1, Γ)o(*q*, *H*, Γ)o(*q*, *H*, Γ)$\bigcap_R$ (*q*, *H*, Γ)*o*(*u*, V_1, Γ)*o*(*q*, *H*, Γ)$\bigcap_R$ (*q*, *H*, Γ)o (*q*, *H*, Γ) *o*(*u*, V_1, Γ) = (*g*, V_1, Γ)$\bigcap_R$ (*h*, V_1, Γ) $\bigcap_R$ (*i*, V_1, Γ) → (5)

(*u*, V_1, Γ)o(*q*, *H*, Γ)o(*q*, *H*, Γ)$\bigcap_R$ (*q*, *H*, Γ)*o*(*u*, V_1, Γ)*o*(*q*, *H*, Γ)$\bigcap_R$ (*q*, *H*, Γ)o (*q*, *H*, Γ) *o*(*u*, V_1, Γ) = (*w*, V_1, Γ) → (6)

Revised Manuscript Received on June 01, 2019.

B. Ravi Kumar, Research Scholar, Department of Mathematics, Adikavi Nannayya University, Rajamundry, A.P. India.
D. Madhusudhana Rao, Department of Mathematics, VSR & NVR College, Tenali, Guntur(Dt), A.P. India.
T. Satish, Department of Mathematics, SRKR Engineering College, Bhimavaram, W.G. Dist. A.P. India
B. Sankara Rao, Department of Mathematics, Adikavi Nannayya University, Rajamundry, A.P. India.
M. Vasantha, Department of Mathematics, DNR Engineering College, Bhimavaram, W.G. Dist. A.P. India.

But (u, V_1, Γ) is a SQTΓI over T. Therefore,
$(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma \cap_R (q, H, \Gamma)o(u, V_1, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma)o(u, V_1, \Gamma) \subseteq (u, V_1, \Gamma) \rightarrow (7)$.
From equation (6) we have $(w, V_1, \Gamma) \subseteq (u, V_1, \Gamma)$ that is $w(h_1) \subseteq u(h_1)\ \forall\ h_1 \in V_1$.
Again form equation (6), we can write
$u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) = w(h_1)\ \forall\ h_1 \in V_1$.
$\Rightarrow u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) \subseteq u(h_1) \rightarrow (8)$. Similarly from (1), (3), (4)
$(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma)o(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma o(u, V_1, \Gamma) = (l, V_1, \Gamma) \rightarrow (9)$
As (u, V_1, Γ) is a SQTΓI over T
$(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma)o(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma o(u, V_1, \Gamma) \subseteq (u, V_1, \Gamma)$.
Therefore, $(l, V_1, \Gamma) \subseteq (u, V_1, \Gamma)$, that is $l(h_1) \subseteq u(h_1)\ \forall\ h_1 \in V_1$.
From equation (9),
$.u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\gamma\, q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1)\,\delta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) = l(h_1)\ \forall\ h_1 \in V_1$.
$\Rightarrow u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\gamma\, q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1)\,\delta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) \subseteq u(h_1) \rightarrow (10)$
From equation (8) and (10) we have, $u(v_1)$ quasi-tΓ-ideal.

Conversely, suppose that $u(h_1) \neq \emptyset$ is a quasi- tΓ-ideal of T for all $h_1 \in V_1$.
Now we show that (u, V_1, Γ) is a SQTΓI l over T. From equations (1), (2) and (3)

$(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(u, V_1, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma)\, o(u, V_1, \Gamma)$

$= (g, V_1, \Gamma) \cap_R (h, V_1, \Gamma) \cap_R (i, V_1, \Gamma) = (w, V_1, \Gamma)$.

By the definition
$u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) = w(h_1)\ \forall\ h_1 \in V_1$.
Since $u(h_1)$ is a quasi- tΓ-ideal of T. Therefore,
$w(h_1) = u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) \subseteq u(h_1)$ and hence $w(h_1) \subseteq u(h_1)$
$\Rightarrow (w, V_1, \Gamma) \subseteq (u, V_1, \Gamma)$.
Thus $(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(u, V_1, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma)o(u, V_1, \Gamma) \subseteq (u, V_1, \Gamma) \rightarrow (11)$
Now form equation (1), (3) and (4)

$(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma)o(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma\, o(u, V_1, \Gamma) = (g, V_1, \Gamma) \cap_R (i, V_1, \Gamma) \cap_R (h, V_1, \Gamma) = (l, V_1, \Gamma)$
$\Rightarrow u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\gamma\, q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1)\,\delta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) = l(h_1)\ \forall\ h_1 \in V_1$.
$\Rightarrow l(h_1) = u(h_1)\,\alpha\, q(h_1)\,\beta\, q(h_1) \cap q(h_1)\,\gamma\, q(h_1)\,\alpha\, u(h_1)\,\beta\, q(h_1)\,\delta\, q(h_1) \cap q(h_1)\,\alpha\, q(h_1)\,\beta\, u(h_1) \subseteq u(h_1)$
$\Rightarrow (l, V_1, \Gamma) \subseteq (u, V_1, \Gamma)$
$\Rightarrow (u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma)o(u, V_1, \Gamma)o(q, H, \Gamma)o(q, H, \Gamma) \cap_R (q, H, \Gamma)o(q, H, \Gamma\, o(u, V_1, \Gamma) \subseteq (u, V_1, \Gamma) \rightarrow (12)$. Therefore, from equations (11) and (12) we can say that (u, V_1, Γ) is a SQTΓI over T.

Th 4.3: Let (*r*, P$_1$, Γ); (*l*, *P*$_2$, Γ) and (*m*, *P*$_3$, Γ) be SLTΓI, SMTΓI, SRTΓI over T, respectively. Then $(r, P_1, \Gamma) \cap_R (m, P_3, \Gamma) \cap_R (l, P_2, \Gamma)$ is a SQTΓI over T.

Th 4.4: Let (*r*, P$_1$, Γ); (*l*, *P*$_2$, Γ) and (*m*, *P*$_3$, Γ) be SLTΓI, SMTΓI, SRTΓI over T, respectively, such that $P_1 \cap P_2 \cap P_3 \neq \emptyset$. Then $(r, P_1, \Gamma) \cap_E (m, P_3, \Gamma) \cap_E (l, P_2, \Gamma)$ is SQTΓI over T.

Proof: By the definition we have $(h, P_4, \Gamma) = (r, P_1, \Gamma) \cap_E (m, P_2, \Gamma) \cap_E (l, P_3, \Gamma)$,
Where, $P_4 = P_1 \cup P_2 \cup P_3$, $P_1 \cap P_2 \cap P_3 = \emptyset$

and $h(v) = \begin{cases} r(v) \text{ if } v \in P_1 - P_2 \cap P_3 \\ m(v) \text{ if } v \in P_3 - P_1 \cap P_2 \\ l(v) \text{ if } v \in P_2 - P_1 \cap P_3. \end{cases}$

For any $v \in P_4$, in each of the case $h(v)$ is a QTΓI of T. As every L(M, R) TΓI of T is QTΓI of T $\Rightarrow$ by definition $(h, P_4, \Gamma) = (r, P_1, \Gamma) \cap_E (m, P_2, \Gamma) \cap_E (l, P_3, \Gamma)$ is a SQTΓI over T.

Th 4.5: Every SLTΓI(SMTΓI, SRTΓI) over TΓ-SR T is a SQTΓI over T.

Proof: Let (l, P_1, Γ) be a SLTΓI over *T*. Then $l(p_1)$ is a LTΓ-ideal of *T*.

As each LTΓ-ideal of T is a QTΓI of *T*, therefore $l(a)$ is a QTΓI of *T*. $\therefore (L, P, \Gamma)$ is a SQTΓI over T.

Note 4.6: The converse of the th 4.5, is not true

Ex 4.7: Let

$T = \left\{ \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 1 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 1 & 0 \end{pmatrix}, \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix} \right\}$

and $\Gamma = \left\{ \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \right\}$ be a TΓ-SR under usual addition and matrix ternary multiplication. Let $P_1 = \{\alpha\}$ and $q: P_1 \longrightarrow P(T)$ defined as $q(\alpha) = \left\{ \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}, \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix} \right\}$. Then (q, P_1, Γ) be a SQTΓI over T,

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

but it is not a SLTΓI, SMTΓI, SRTΓI over T.

Th 4.8: Every SLTΓI, SMTΓI, SRTΓI over T is a STΓ-SR over T.

Th 4.9: Every SQTΓI over T is STΓ-SR over T.

Th 4. 10: Let (l, P_1, Γ), (m, P_2, Γ) and (r, P_3, Γ) be SLTΓI, SMTΓI, SRTΓI over T, respectively. Then $(l, P_1, \Gamma) \wedge (m, P_2, \Gamma) \wedge (r, P_3, \Gamma)$ is a SQTΓI over T.

Proof: By the definition $(h, P_4, \Gamma) = (l, P_1, \Gamma) \wedge (m, P_2, \Gamma) \wedge (r, P_3, \Gamma)$ where $P_4 = P_1 \times P_2 \times P_3$, and for any $(l_1, l_2, l_3) \in P_1 \times P_2 \times P_3$, $h(l_1, l_2, l_3) = l(l_1) \cap m(l_2)\, l(l_3)$ is a QTΓI of T. Since the intersection of a L(M, R)TΓ-ideal is a QTtΓI of T, thus, $(l, P_1, \Gamma) \wedge (m, P_2, \Gamma) \wedge (r, P_3, \Gamma)$ is a SQTΓI over T.

Th 4.11: Let (f, P_1, Γ) and (g, P_2, Γ) be two SQTΓIs over a TΓ-SR T. Then the statements hold.

(1) $(e, P_1, \Gamma) \cap_R (j, P_2, \Gamma)$ is a SQTΓI over T.

(2) $(e, P_1, \Gamma) \cap_E (j, P_2, \Gamma)$ is a SQTΓI over T.

(3) $(e, P_1, \Gamma) \wedge (j, P_2, \Gamma)$ is a SQTΓI over T.

(4) $(e, P_1, \Gamma) \cup_E (j, P_2, \Gamma)$ is a SQTΓI over T,

whenever $P_1 \cap P_2 = \emptyset$.

Th 4.12: Let (e, P_1, Γ) be a SQTΓI and (j, P_2, Γ) a STΓ-SR over T. Then, $(e, P_1, \Gamma) \cap_R (j, P_2, \Gamma)$ is a SQTΓI l of (j, P_2, Γ).

Proof: By definition $(l, P, \Gamma) = (e, P_1, \Gamma) \cap_R (j, P_2, \Gamma)$, where $P = P_1 \cap P_2 \neq \emptyset$ and $l(h) = e(h) \cap j(h)$ for all $h \in P$, as $l(h) \subseteq e(h)$ and $l(h) \subseteq j(h)$. We show that $l(h)$ is a QTΓI of $j(h)$. Since $l(h) \subseteq j(h)$,

$$l(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma l(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma l(h)$$
$$\subseteq j(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma j(h)$$
$$\subseteq j(h)\Gamma j(h)\Gamma j(h) \subseteq j(h)$$

Because, $j(h)$ is a TΓ-SSR of T. This implies that

$$l(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma l(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma l(h) \subseteq j(h) \longrightarrow (1)$$

Also $l(h) \subseteq e(h)$. So

$$l(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma l(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma l(h)$$
$$\subseteq e(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma e(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma e(h)$$
$$\subseteq e(h)\Gamma q(h)\Gamma q(h)\cap q(h)\Gamma e(h)\Gamma q(h)\cap q(h)\Gamma q(h)\Gamma e(h) \subseteq e(h)$$

Because, $e(h)$ is a quasi-tΓ-ideal of T. Thus

$$l(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma l(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma l(h) \subseteq e(h) \longrightarrow (2)$$

From equation (1) and (2) we have

$$l(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma l(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma l(h)$$
$$\subseteq e(h)\cap j(h) = l(h) \longrightarrow (3)$$

Similarly, we can show that

$$l(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma l(h)\Gamma j(h)\Gamma j(h)\cap j(h)\Gamma j(h)\Gamma l(h)$$
$$\subseteq l(h) \longrightarrow (4)$$

From equation (3) and (4) we have $l(h)$ is a quasi-tΓ-ideal of $j(h)$.

$(e, P_1, \Gamma) \cap_R (j, P_2, \Gamma)$ is a SQTΓI of (j, P_2, Γ).

ACKNOWLEDGMENT

Authors are very grate full to SRKR Engineering College, Bhimavaram, W.G. District, A.P. for their support to publish this paper.

REFERENCES

1. M. I. Ali, F. Feng, X. Y. Liu, W. K. Min and M. Shabir, "On some new operations in soft set theory", Comput. Math.Appl. 57 (2009) 1547{1553.
2. F. Feng, X. Y. Liu, V. Leoreanu-Fotea and Y. B. Jun, "Soft sets and soft rough sets", Inform.Sci. 181 (2011) 1125-1137.
3. F. Feng, Y. B. Jun and X. Zhao, "Soft semirings", Comput.Math.Appl. 56 (2008) 2621-2628.
4. P. K. Maji, R. Biswas and A. R. Roy, "Soft set theory", Comput. Math.Appl. 45 (2003) 555-562.
5. D. Molodtsov, "Soft set theory-First results", Comput. Math. Appl. 37 (4-5) (1999) 19-31.
6. K. Revathi,P. Sundarayya, D. MadhusudhanaRao, P. Siva Prasad- "Compositions of Fuzzy TΓ-Ideals in Ternary Γ-Semi ring",International Journal of Advanced in Management, Technology and Engineering Sciences, ISSN NO : 2249-7455, Volume 07, Issue 12, December, 2017, pp: 135-145.
7. K.SriLatha,D.MadhusudhanaRao, G.ShobhaLatha, "Right Derivation of Ternary Γ-semirings", American International Journal of Research in Science, Technology, Engineering & Mathematics (AIJRSTEM) ISSN: 2328-3491, 2018, pp: 30-33.
8. M. Vasantha, D. MadhusudhanaRao, K. Praveenkumar, T. Satish,"On Regular Ternary **Γ-Semigroups",** International Journal of Pure and Applied Mathematics, Volume 118, No 2, 2018, 181-194.

* * * * *

AUTHORS PROFILE

B.Ravi Kumar completed his M.Sc and M.Tech (Computer Science) from Andhra University, Visakhapatnam, Andhra Pradesh and M.Phil from S.V University, Tirupathi, Andhra Pradesh, India Now he is Pursuing Ph.D form Adikavi Nannaya University, Rajahmundry, Andhra Pradesh. He is working as an Asst.Professor in Mathematics, in the department of Mathematics, ANITA Engineering College, Sangivalasa, Visakhapatnam Andhra Pradesh, India

Dr D. Madhusudhana Rao completed his M.Sc. from Osmania University, Hyderabad, Telangana, India. M. Phil. from M. K. University, Madurai, Tamil Nadu, India. Ph.D. from Acharya Nagarjuna University, Andhra Pradesh, India. He joined as Lecturer in Mathematics, in the department of Mathematics, VSR & NVR College, Tenali, A. P. India in the year 1997, after that he promoted as Head, Department of Mathematics, VSR & NVR College, Tenali. At present he is working as professor of Mathematics. He helped more than 10 Ph.D's, 4 M'Phil and at present he guided 5 Ph. D. Scholars in the department of Mathematics, Acharya Nagarjuna University, Nagarjuna Nagar, Guntur, A. P. He received Andhra Pradesh State Best Teacher Award from Govt. of Andhra Pradesh in the year 2018. He also received National Excellent Award in the same year. A major part of his research work has been devoted to the use of semigroups, Gamma semigroups, duo gamma semigroups, partially ordered gamma semigroups and ternary semigroups, Gamma semirings and ternary semirings, Near rings ect. He is acting as peer review member to the "*British Journal of Mathematics & Computer Science"*. He published more than 150 research papers in different International Journals in the last two academic years.

T.Satish completed his M.Sc and M.Phil from Acharya Nagarjuna University, Guntur, Andhra Pradesh, India. Now he is Pursuing Ph.D under the guidance of Dr.D.Madhusudhana Ro from Acharya Nagarjuna University, Guntur, He is working as an Asst.Professor in Mathematics, in the department of Mathematics, SRKR Engineering College, Bhimavaram, Andhra Pradesh, India. He is published more than 8 research papers in popular international Journals to his credit.

B.Sankara Rao completed his Ph.D from Central University, he published 6 research papers in International Journals. He is a member in Associate Fellow Andhra Pradesh Academy of Sciences, Life member Andhra Pradesh Society for Mathematical Education and Life member Association for Improvement of Mathematical Education. Act as a BOS member for various affiliated colleges.

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication

M.Vasantha She is working as an Asst.Professor in the Department Mathematics, DNR Engineering College,, Bhimavaram, A. P. INDIA.

She completed her M.Phil. in Madhurai Kamaraj University, Tamil Nadu, India. She is pursuing Ph.D. under the guidance of Dr. D. Madhusudanarao in K. L.University. She published more than 8 research papers in popular international Journals to her credit. Her areas of interests are ternary semirings, ordered ternary semirings, semirings and topology. Presently she is working on Ternary Γ-semigroup

* * * * *

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication