A STUDY OF NEUTROSOPHIC R_g – CLOSED SETS

Abstract

This paper introduces the idea of neutrosophic $\mathbb{R}_{g}$ closed (Regular Generalised Closed) sets, which are new neutrosophic closed sets in topological spaces. Additionally, some of its connections to other neutrosophic closed sets that already exist have been analysed, and some of their characteristics have been examined.

Keywords: Neutrosophic R-closed, Neutrosophic g-open, Neutrosophic $\mathbb{R}_{g}$ closure

Authors

R Poornima
Associate Professor
Department of Mathematics
Hindusthan College of Engineering and Technology
Coimbatore, Tamil Nadu, India
poornimavisaanth@gmail.com

S Girija
Associate Professor
Department of Mathematics
Hindusthan College of Engineering and Technology
Coimbatore, Tamil Nadu, India
girijas.maths@hicet.ac.in

C Gayathri
Assistant Professor in Mathematics
Department of Science and Humanities
Oxford College of Engineering
Bangalore, Karnataka, India
gayulethu11@gmail.com

P Gayathri
Assistant Professor in Mathematics
Department of Science and Humanities
Karpagam College of Engineering
Coimbatore, Tamil Nadu, India
gayucbe@gmail.com

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I. INTRODUCTION

Zadeh [1] first proposed the fuzzy set theory who also researched truth ($\mathfrak{T}$), the degree of membership, and defined it. Atanassov [2,3,4] presented the falsity ($\mathfrak{F}$), often known as the degree of nonmembership, in an intuitionistic fuzzy set. The intuitionistic fuzzy topology was created by Coker [5]. Smarandache [6,7] first proposed the concept of neutrality ($\mathfrak{I}$), or the degree of uncertainty, in 1998. Additionally, he described the neutrosophic set as consisting of three elements: truth, falsehood, and indeterminacy. Salama et al.'s translation of the neutrosophic crisp set notion into neutrosophic topological spaces may be found in [8]. As a result, a wide range of research on neutosophic topology and its application in decision-making algorithms became possible. In neutrosophic topoloical spaces, Arokiarani et al. [9] introduced and investigated α-open sets. Devi et al. [10,11,12] presented generally αψ-closed sets. This study introduces the idea of Neutrosophic $\mathbf{R_g}$ -closed sets and Neutrosophic $\mathbf{R_g}$ -open sets in Neutrosophic topological space and studies some of their characteristics.

II. PRELIMINARIES

Throughout this paper, $\mathfrak{X}$ denote the neutrosophic topological space ($\mathfrak{X}$, $\mathfrak{N}_\tau$) and for a subset $\mathfrak{N}$Å of ($\mathfrak{X}$, τ) the closure of $\mathfrak{N}$Å, interior of $\mathfrak{N}$Å, regular closure of $\mathfrak{N}$Å denoted by cl($\mathfrak{N}$Å), int($\mathfrak{N}$Å),rcl($\mathfrak{N}$Å) respectively.

Explanation 2.1: A Subset $\mathfrak{N}$Å of ($\mathfrak{X}$, $\mathfrak{N}_\tau$) is called if

- Regular neutrosophic Closed(r- closed) Set [9] if cl(int($\mathfrak{N}$Å))= $\mathfrak{N}$Å.
- Regular generalized neutrosophic closed(briefly neutrosophic rg – closed)set[6] if cl($\mathfrak{N}$Å)⊆Z whenever $\mathfrak{N}$Å ⊆ Z and Z is regular neutrosophic open in $\mathfrak{X}$.
- Neutrosophic δ–closed set [10] if $\mathfrak{N}$Å =cl_δ($\mathfrak{N}$Å), wherecl_δ(A)= {u ϵ $\mathfrak{X}$: int(cl(Z))∩ $\mathfrak{N}$Å ≠ ϕ,Zϵτ and u ϵ Z}
- Weakly π- generalized neutrosophic closed (briefly wπg – closed)[7] if cl(int($\mathfrak{N}$Å)) ⊆ Z whenever $\mathfrak{N}$Å ⊆ Z and Z is neutrosophic π-open in $\mathfrak{X}$.
- Regular Feebly Generalized neutrosophic closed (briefly RFG – closed) set [11] if fcl($\mathfrak{N}$Å) ⊆ Z whenever $\mathfrak{N}$Å ⊆Z and Z is regular generalized neutrosophic open (rg – open) set in $\mathfrak{X}$.
- semi-closed[4] if int(cl($\mathfrak{N}$Å)) ⊆ $\mathfrak{N}$Å.

Explanation 2.2: A Subset $\mathfrak{N}$Å of a neutrosophic topological space ($\mathfrak{X}$, $\mathfrak{N}_\tau$) is called

- Generalized neutrosophic closed set (briefly g-closed) [3] if cl($\mathfrak{N}$Å) ⊆ Z whenever$\mathfrak{N}$Å ⊆ Z and Z is open in ($\mathfrak{X}$, $\mathfrak{N}_\tau$) .
- Weakly generalized neutrosophic closed (briefly wg-closed) [5]if cl(int(A)) ⊆ Z whenever $\mathfrak{N}$Å ⊆ Z and Z is open in $\mathfrak{X}$.
- regular weakly generalized (briefly neutrosophic rwg-closed) [5] if cl(int($\mathfrak{N}$Å)) ⊆ Z whenever $\mathfrak{N}$Å ⊆Z and Z is regular neutrosophic open in $\mathfrak{X}$.

Explanation 2.3: Let $\mathfrak{X}$ be a neutrosophic topological space. The finite union of regular neutrosophic open sets in $\mathfrak{X}$ is said to be neutrosophic π-open set [2]. The complement of a neutrosophic π-open set is said to be neutrosophic π-closed set [2].

Explanation 2.4: A subset 𝔑Å of a neutrosophic topological space ($\mathfrak{X}$, $\mathfrak{N}_\tau$) is called

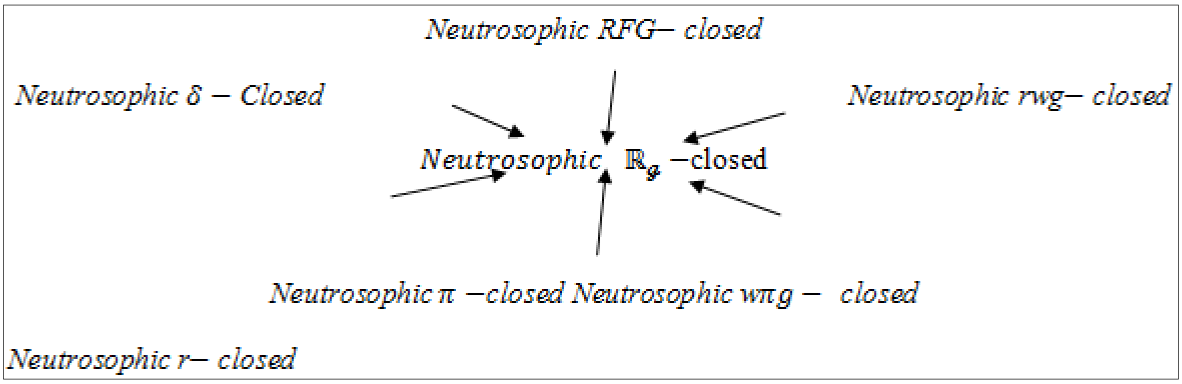
- Neutrosophic Pre-closed set [8] if cl(int(𝔑Å)) ⊆ 𝔑Å.
- Neutrosophic β – closed set [1] if int(cl(int(𝔑Å)))⊆ 𝔑Å.

The complements of the above mentioned neutrosophic closed sets are their respective neutrosophic open sets.

III. NEUTROSOPHIC $\mathbb{R}_g$ – CLOSED SETS

Explanation 3.1: A subset 𝔑Å of a neutrosophic topological space ($\mathfrak{X}$, $\mathfrak{N}_\tau$) is called a regular generalized neutrosophic closed set(briefly $\mathbb{R}_g$– closed) if rcl(𝔑Å) ⊆ Z whenever 𝔑Å ⊆ Z and Z is neutrosophic g open in ($\mathfrak{X}$, $\mathfrak{N}_\tau$) .The complement of a neutrosophic $\mathbb{R}_g$ – closed set is neutrosophic $\mathbb{R}_g$ – open set.

Remark 3.1



Principium 3.1: Every neutrosophic closed sets are neutrosophic $\mathbb{R}_g$ -closed sets.
Testament: Let 𝔑Å be any neutrosophic closed set in $\mathfrak{X}$. Suppose Z is neutrosophic τ-open. Since every neutrosophic τ-open set is neutrosophic g-open and 𝔑Å is neutrosophic closed, we have cl(𝔑Å)⊆rcl(𝔑Å)⊆ Z implies cl(𝔑Å)⊆ Z, Z is neutrosophic g-open. Hence 𝔑Å is neutrosophic R_g-closed.

Principium 3.2: Every neutrosophic RFG-closed sets are neutrosophic $\mathbb{R}_g$ –closed sets.
Testament: Let 𝔑Å be any neutrosophic RFG-closed set in $\mathfrak{X}$.Suppose Z is 𝔑Å rg-open in $\mathfrak{X}$ *s*uch that 𝔑Å ⊆ Z. Since every neutrosophic g-open set is neutrosophic rg-open and 𝔑Å is neutrosophic RFG-closed,we have rcl(𝔑Å)⊆ fcl(𝔑Å) ⊆ Z implies rcl⊆ Z, Z is g-open. Hence 𝔑Å is neutrosophic $\mathbb{R}_g$-closed.
The following Illustration 3.3 clears that the converse of the Principium 3.1 need not be true.

Illustration 3.3: Let $\mathfrak{X} = \{(\mathfrak{T}_ℷ, \mathfrak{I}_ℷ, \mathfrak{F}_ℷ), (\mathfrak{T}_ℶ, \mathfrak{I}_ℶ, \mathfrak{F}_ℶ), (\mathfrak{T}_\aleph, \mathfrak{I}_\aleph, \mathfrak{F}_\aleph)\}$
τ ={ϕ,$\mathfrak{X}$,{a},{b,c}{a,b,c}}. Neutrosophic R_g-closed sets are
{ $\mathfrak{X}$, ϕ,{ ($\mathfrak{T}_■, \mathfrak{I}_■, \mathfrak{F}_■$)},{ ($\mathfrak{T}_\aleph, \mathfrak{I}_\aleph, \mathfrak{F}_\aleph$), ($\mathfrak{T}_■, \mathfrak{I}_■, \mathfrak{F}_■$)},
{ ($\mathfrak{T}_ℶ, \mathfrak{I}_ℶ, \mathfrak{F}_ℶ$), ($\mathfrak{T}_■, \mathfrak{I}_■, \mathfrak{F}_■$)},{ {($\mathfrak{T}_ℷ, \mathfrak{I}_ℷ, \mathfrak{F}_ℷ$), ($\mathfrak{T}_■, \mathfrak{I}_■, \mathfrak{F}_■$)}{ ($\mathfrak{T}_ℷ, \mathfrak{I}_ℷ, \mathfrak{F}_ℷ$), ($\mathfrak{T}_ℶ, \mathfrak{I}_ℶ, \mathfrak{F}_ℶ$),
($\mathfrak{T}_■, \mathfrak{I}_■, \mathfrak{F}_■$)},

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$\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}\}$, neutrosophic RFG-closed sets are $\{ \mathfrak{X} ,\phi,\{ (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}, \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}, \{\{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}\}$.
Here $\{(\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}$ and $\{(\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}$ are neutrosophic $\mathbb{R}_g$-closed but not neutrosophic RFG-closed.

Principium 3.4: Every neutrosophic $\mathbb{R}_g$–closed sets are neutrosophic rwg-closed sets.
Testament: Let $\mathfrak{R}$Å be any neutrosophic $\mathbb{R}_g$–closed set in $\mathfrak{X}$. Suppose Z is neutrosophic r-open in $\mathfrak{X}$ Since every neutrosophic r-open set is neutrosophic g-open in X and $\mathfrak{R}$Å is neutrosophic $\mathbb{R}_g$-closed, we have cl(int($\mathfrak{R}$Å)) ⊆ rcl($\mathfrak{R}$Å) ⊆ Z implies cl(int($\mathfrak{R}$Å)) ⊆ Z, Z is neutrosophic g-open. Hence $\mathfrak{R}$Å is neutrosophic rwg-closed.
The following Illustration 3.5 clears that the converse of the Principium 3.3 need not be true.

Illustration 3.5: Let $\mathfrak{X} = \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}$,
$\tau =\{\phi, \mathfrak{X} ,\{\{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel)\},\{(\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth)\}, \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\}\}$.

Neutrosophic rwg-closed sets are $\{ \mathfrak{X} ,\phi,\{ (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth)\}, \{(\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}, \{\{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}, \{\{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}, \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\} \}$

Neutrosophic $\mathbb{R}_g$-closed sets are $\{ \mathfrak{X} ,\phi,\{ (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}, \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}\}$. Here $\{(\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ (\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\}, \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\}$ are neutrosophic rwg-closed but not neutrosophic R_g-closed.

Principium 3.6: Every neutrosophic $\mathbb{R}_g$–closed sets are neutrosophic wπg-closed set.
Testament: Let $\mathfrak{R}$Å be any neutrosophic $\mathbb{R}_g$–closed set in $\mathfrak{X}$.Suppose Z is π-open in $\mathfrak{X}$. Since every neutrosophic π-open set is neutrosophic g-open in $\mathfrak{X}$ and $\mathfrak{R}$Å is R_g-closed, we have cl(int($\mathfrak{R}$Å)) ⊆ rcl($\mathfrak{R}$Å) ⊆ Z implies cl(int($\mathfrak{R}$Å)) ⊆ Z, Z is neutrosophic g-open. Hence $\mathfrak{R}$Å is neutrosophic wπg-closed.
The following Illustration 3.7 clears that the converse of the Principium 3.6 need not be true.

Illustration 3.7: Let $\mathfrak{X} = \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}$, $\tau =\{\phi, \mathfrak{X} ,\{ (\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth)\}, \{\{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\}\}$, neutrosophic wπg -closed sets are $\{\phi, \mathfrak{X} ,\{ (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\}, \{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\},\{ (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\}, \{(\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph)\}, \{\{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\beth,\mathfrak{I}_\beth,\mathfrak{F}_\beth), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\},\{ \{(\mathfrak{T}_\gimel,\mathfrak{I}_\gimel,\mathfrak{F}_\gimel), (\mathfrak{T}_\aleph,\mathfrak{I}_\aleph,\mathfrak{F}_\aleph), (\mathfrak{T}_\blacksquare,\mathfrak{I}_\blacksquare,\mathfrak{F}_\blacksquare)\} \}$,

$\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}$,neutrosophic $\mathbb{R}_{g}$–closed sets are$\{\phi,\mathfrak{X},\{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),,(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},$
$\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},$
$\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}$.Here $\{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\},$
$\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}$ are neutrosophic wπg -closed but not neutrosophic $\mathbb{R}_{g}$-closed.

Principium 3.8: Every neutrosophic r-closed sets are neutrosophic $\mathbb{R}_{g}$-closed set.

Testament: Let $\mathfrak{R}$Å be any neutrosophic r-closed set in $\mathfrak{X}$ .Suppose Z is neutrosophic g-open in $\mathfrak{X}$. Since every neutrosophic r-open set is g-open in $\mathfrak{X}$ and $\mathfrak{R}$Å is neutrosophic r-closed,we have cl(int($\mathfrak{R}$Å)) ⊆ rcl(A) ⊆ Z implies cl(int($\mathfrak{R}$Å)) ⊆ Z, Z is neutrosophic g-open. Hence $\mathfrak{R}$Å is neutrosophic $\mathbb{R}_{g}$-closed.

The following Illustration 3.9 clears that the converse of the Principium 3.7 need not be true.

Illustration 3.9: Let $\mathfrak{X}=\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}$,
$\tau=\{\phi,\mathfrak{X},\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\},$
$\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}\}$, neutrosophic r -closed sets are$\{\phi,\mathfrak{X},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}$, neutrosophic $\mathbb{R}_{g}$–closed sets are$\{\phi,\mathfrak{X},\{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\},$
$\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},$
$\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}$.Here $\{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},$
$\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\}$ are neutrosophic $\mathbb{R}_{g}$–closed but not neutrosophic r-closed.

Principium 3.10: Every neutrosophic δ-closed sets are neutrosophic $\mathbb{R}_{g}$-closed set.

Testament: Let $\mathfrak{R}$Å be any neutrosophic δ-closed set in $\mathfrak{X}$ .Suppose Z is neutrosophic τ-open in $\mathfrak{X}$. Since every neutrosophic τ-open set is neutrosophic g-open in $\mathfrak{X}$ .We have,rcl($\mathfrak{R}$Å) ⊆ cl_{δ}(A$\mathfrak{R}$Å) ⊆ Z implies rcl($\mathfrak{R}$Å) ⊆ Z, Z is neutrosophic g-open. Hence $\mathfrak{R}$Å is neutrosophic R_{g}-closed.

The following Illustration 3.11 clears that the converse of the Principium 3.9 need not be true.

Illustration:3.11 Let $\mathfrak{X}=\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}$,
$\tau=\{\phi,\mathfrak{X},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\},$
$\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\}\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\},$
$\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}\}$ then δ-closed sets
are$\{\mathfrak{X},\phi,\{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),,(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},$
$\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}$and
neutrosophic $\mathbb{R}_{g}$ –closed sets are
$\{\mathfrak{X},\{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),$
$(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\},\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\},$
$(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\},(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}\}\}$.Here
$\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\},\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}),(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}),(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}$ are neutrosophic $\mathbb{R}_{g}$-closed,but not neutrosophic δ-closed.

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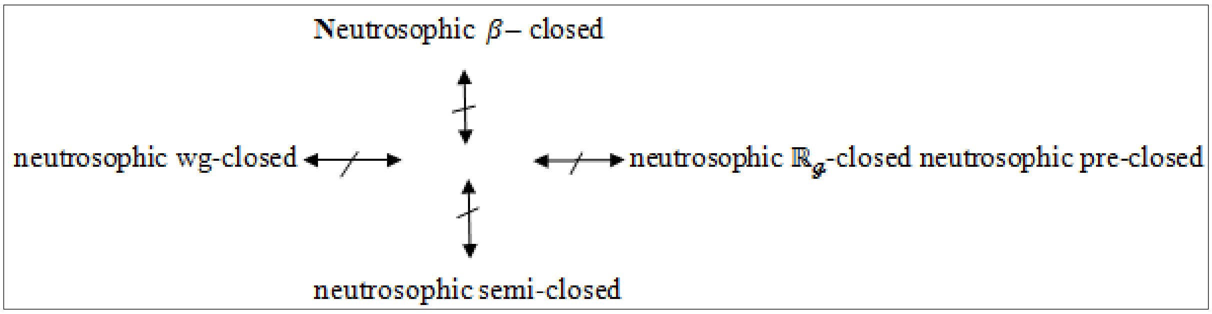
Principium :3.12 Every neutrosophic π-closed sets are neutrosophic $\mathbb{R}_{g}$–closed set.

Testament: Let $\mathfrak{R}$Å be any neutrosophic π-closed set in $\mathfrak{X}$. Suppose Z is neutrosophic r-open in $\mathfrak{X}$.Since every neutrosophic r-open set is neutrosophic g-open in $\mathfrak{X}$ and by the Explanation of neutrosophic π-closed set, $\mathfrak{R}$Å is union of neutrosophic r-closed. By Principium 3.8, we have neutrosophic r-closed implies neutrosophic$\mathbb{R}_{g} -$ closed. Hence, neutrosophic $\pi -$ closed is neutrosophic $\mathbb{R}_{g}$-closed.

Remark: 3.13



Remark 3.14: The following Illustration clears that neutrosophic $\mathbb{R}_{\square}$ – closed sets are independent from neutrosophic β – closed, neutrosophic wg – closed, neutrosophic Pre – closed, neutrosophic Semi – closed.

Illustration 3.15: $\mathfrak{X} = \{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}$ be the nutrosophic topological space.

- Consider the neutrosophic topology $\tau = \{\phi, \mathfrak{X}, \{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\}, \{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}\}$. Here the neutrosophic β – closed set is $\{\phi, \mathfrak{X}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), \}, \{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}, \{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}$ and neutrosophic $\mathbb{R}_{g}$ – closed sets are $\{\phi, \mathfrak{X}, \{(\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}, \{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}\}$ Here$\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel})\}$, $\{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}\}$ are neutrosophic β – closed but not neutrosophic $\mathbb{R}_{g}$ – closed. Also$\{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}$, $\{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}$ is neutrosophic R_g – closed but not neutrosophic β – closed set.

- Consider the neutrosophic topology $\tau = \{\phi, \mathfrak{X}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph})\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}\}, \{\{(\mathfrak{T}_{\gimel},\mathfrak{I}_{\gimel},\mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}$. Here the neutrosophic $\mathbb{R}_{g}$– closed sets are $\{\phi, \mathfrak{X}, \{(\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\beth},\mathfrak{I}_{\beth},\mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph},\mathfrak{I}_{\aleph},\mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare},\mathfrak{I}_{\blacksquare},\mathfrak{F}_{\blacksquare})\}$,

$\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}$ and neutrosophic Pre – closed sets are $\{\phi, \mathfrak{X}, \{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph})\}, \{(\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\},$ $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}$. Here $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}$ is neutrosophic $\mathbb{R}_{g}$ – closed but not Pre – closed.

- Consider the neutrosophic topology
  $\tau=\{\phi, \mathfrak{X}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel})\}\}, \{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth})\}, \{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph})\},$
  $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph})\}\}$. Here the neutrosophic Semi – closed are $\{\phi, \mathfrak{X}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel})\}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph})\},$ $\{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}$ and neutrosophic $\mathbb{R}_{g}$ – closed sets are $\{\phi, \mathfrak{X}, \{(\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}, \{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth},, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}$ $, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}),, (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{a, (\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), \{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}$ $, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}$. Here the set $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel})\}, \{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph}, (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph})\}\}$ are neutrosophic Semi – closed but notneutrosophic $\mathbb{R}_{g}$ – closed and $\{\{(\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth})\}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}),, (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), c, (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}$ are neutrosophic $\mathbb{R}_{g}$– closed but not neutrosophic Semi – closed.

- Consider the neutrosophic topology
  $\tau=\{\phi, \mathfrak{X}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel})\}, \{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth})\}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth})\}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}),$ $(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph})\}\}$. Here the neutrosophic wg – closed sets are $\{\phi, \mathfrak{X}, \{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph})\}, \{(\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}),, (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}),, (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\aleph}, (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}\}$ and neutrosophic $\mathbb{R}_{g}$ – closed sets are $\{\phi, \mathfrak{X}, \{(\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{(\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}),, (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{(\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}),, (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\},$ $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\aleph}, \mathfrak{I}_{\aleph}, \mathfrak{F}_{\aleph}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}\}$. Here the set $\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}$ is neutrosophic wg – closed but not neutrosophic $\mathbb{R}_{g}$ – closed and $\{\{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}, \{\{(\mathfrak{T}_{\gimel}, \mathfrak{I}_{\gimel}, \mathfrak{F}_{\gimel}), (\mathfrak{T}_{\beth}, \mathfrak{I}_{\beth}, \mathfrak{F}_{\beth}), (\mathfrak{T}_{\blacksquare}, \mathfrak{I}_{\blacksquare}, \mathfrak{F}_{\blacksquare})\}\}$ are neutrosophic $\mathbb{R}_{g}$ – closed set but not neutrosophic wg- closed.

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