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ON $\#\alpha$-REGULAR GENERALIZED OPEN SETS AND $\#\alpha - RG$ NEIGHBOURHOODS IN TOPOLOGICAL SPACES

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ABSTRACT

In this paper we introduce a new class of open sets called the class of $\#\alpha rg$ -open and study their relationship with other open sets. Also we introduce of $\#\alpha rg$ neighbourhood (shortly$\#\alpha rg$ -nbhd) in topological spaces $\#\alpha rg$-closure.

Keywords: *$\#\alpha rg$ -open sets, $\#\alpha rg$ –nbhd, $\#\alpha rg$-closure*

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1. INTRODUCTION

Regular open sets and rw-open sets have been introduced and investigated by stone [18] and Benchalli and Wali [1] Maki [10] defined α-generalized closed sets in 1994. Dontchev, Gnanambal and Palaniappan and Rao [5, 7, 13] introduce gsp closed sets. Syed Ali Fatima [19] defined #rg-closed sets. In this paper we introduce new class of sets called: $\#\alpha rg$ -open sets which is properly placed in between the class of #rg -open sets and the class of αg-open sets.

Throughout this paper (X,τ) represents a on-empty topological space on which no separation axiom is assumed unless otherwise mentioned. For a subset A of a topological space X, cl(A) and int(A) denote the closure of A and the interior of A respectively (X,τ) will be replaced by X if there is no chance of confusion. X\A or A^c denotes the complement of A in X. Let us recall the following definitions.

Definition 1.1: A Subset A of a space X is called
(1) a preopen set [11] if A⊆ int(cl (A)) and a preclosed set if cl(int (A)) ⊆A
(2) a semiopen set [8] if A⊆cl(int (A)) and a semiclosed set if int(cl (A) ⊆A
(3) an α-open set [21] if A⊆int(cl(int(A))) and an α-closed set [ ]if cl(int(cl(A))) ⊆A
(4) a regular open set [13] if A=int(cl (A))and a regular closed set if A=cl(int (A))
(5) a π-open set [1] if A is a finite union of regular open sets.
(6) regular semi open [15] if there is a regular open U such U⊆A⊆cl(U)

Definition 1.2: A subset A of a topological space (X,τ) is called.
(1) an *α-generalized* closed set (briefly *αg-closed*)[14] if αcl(A) ⊆U whenever A⊆U and U is open in (X,τ) .
(2) a generalized pre closed set (briefly gp-closed) [14] if pcl(A)⊆U whenever A ⊆U and U is open (X,τ)
(3) a generalized semi pre closed set (briefly gsp-closed) [14] if spcl(A)⊆U whenever A⊆U and U is a open (X,τ)
(4) a generalized α--closed (i.e., g α--closed) set [21] if αcl(A) ⊆U whenever A⊆U and U is open set in X.
(5) #rg-closed (19) if cl(A) ⊆U whenever A⊆U and U is rw-open.
(6) $\#\alpha rg$-closed ( ) if αcl(A) ⊆U whenever A⊆U and U is rw-open,

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2. #α-REGULAR GENERALIZED OPEN SETS

In this section we introduce the concept of $\#\alpha rg - open$ sets and characterize their properties.

Definition 2.1: A subset A of a space X is called $\#\alpha - regular$ generalized open (briefly $\#\alpha rg - open$) set if its complement is $\#\alpha rg - closed$. We denote the set of all $\#\alpha rg - open$ sets in X by $\#\boldsymbol{\alpha RG}$**O**($\boldsymbol{X}$)

Remark 2.2: $\alpha cl(X\backslash A) = X\backslash \alpha int(A)$

Theorem 2.3: A subset A of X is $\#\alpha rg - open$ if and only if $F \subseteq \alpha int(A)$ whenever F is rw-closed and $F \subseteq$A.

Proof:

Necessity: Let A be $\#\alpha rg - open$. Let F be rw-closed and $F \subseteq A$ then $X\backslash A \subseteq X\backslash F$ Since X\A is $\#\alpha rg - closed$, $\alpha cl(x\backslash A) \subseteq X\backslash F$ by Remark 2.2 $X\backslash \alpha int(A) \subseteq X\backslash F$ that is $F \subseteq \alpha int\ (A)$.

Sufficiency: Suppose F is rw-closed and $F \subseteq A$ implies $F \subseteq \alpha int\ (A)$. Let X\A⊆U where U is rw-open.Then X\U⊆ A and X\U is rw-closed. By hypothesis $X\backslash$U⊆ $\alpha int(A)$. That is $X\backslash \alpha int(A) \subseteq U$ by Remark 2.2 $\alpha cl(x\backslash A) \subseteq U$. Hence X\A is $\#\alpha rg$ −closed. Thus A is $\#\alpha rg -$ open.

Theorem 2.4: If $\alpha int(A) \subseteq B \subseteq A$ and A is $\#\alpha rg -$ open then B is $\#\alpha rg -$ open.

Proof: Let A be $\#\alpha rg -$ open set and $\alpha int(A) \subseteq B \subseteq A$. Now $\alpha int(A) \subseteq B \subseteq A$ implies $X\backslash A \subseteq X\backslash B \subseteq X\backslash \alpha int\ (A)$. That is $X\backslash A \subseteq X\backslash B \subseteq \alpha cl(x\backslash A)$. Since X\A is $\#\alpha rg - closed$ then A is $\#\alpha rg - open$. X\B is $\#\alpha rg - closed$ then B is $\#\alpha rg - open$.

Remark 2.5: For any $A \subseteq X$, $\alpha int(\alpha cl(A)\backslash A) = \phi$

Theorem 2.6: If $A \subseteq X$ is $\#\alpha rg - closed$ then $\alpha cl(A)\backslash A$ is $\#\alpha rg - open$.

Proof: Let A be $\#\alpha rg - closed$. Let F be rw-closed set such that $F \subseteq \alpha cl(A)\backslash A$. Then by theorem 3.2 [21] F= ϕ So, $F \subseteq \alpha int(\alpha cl(A)\backslash A)$. This shows that $\alpha cl(A)\backslash A$ is $\#\ \alpha rg - open$.

Theorem 2.7: If a subset A of a space X is $\#\ rg - open$ then it is $\#\ \alpha rg - open$ but not conversely.

Proof: Let A be $\#rg - open$ set in space X. Then X\A is $\#rg - closed$ set. By Theorem 3.2 [21] X\A is $\#\ \alpha rg - closed$. Therefore A is $\#\ \alpha rg - open$ set in X.

The converse of the theorem need not be true as seen from the following example.

Example 2.8: Let $X = \{a, b, c, d\}$ be with topology $\tau = \{X, \phi, \{a, b\}\}$ then the set A={a,b,c} is $\#\alpha rg - open$ but not $\#rg - open$ in X.

Corollary 2.9: Every regular open set is $\#\alpha rg - open$ but not conversely.

Proof: Follows from Fathima [20] and Theorem [2.7]

Corollary 2.10: Every $\pi - open$ sent is $\#\alpha rg - open$ but not conversely.

Proof: Follows from Fathima [20] and Theorem [2.7]

Theorem 2.11: If a subset A of a topological space (X,τ) is open that it is $\#\alpha rg - open$ but not conversely.

Proof: Let A be an open set in a space X. Then X\A is closed set. By Theorem 3.7 [21] X\A is $\#\alpha rg - closed$. Therefore A is $\#\alpha rg - open$ set in X. The converse of the theorem need not be true as seen from the following example.

Example 2.12: Let X ={a, b, c, d} be with topology $\tau = \{X, \phi, \{c\}, \{a, b\}, \{a, b, c\}\}$ then the set {b} is $\#\alpha rg - open$ but not open set in X.

Theorem 2.13: If a subset A of a topological Space (X,τ) is $\alpha -$open then it is $\#\alpha rg - open$ but not conversely.

Proof: Let A be $\alpha - open$ set in X. Then X\A is $\alpha - closed$ set then by theorem 3.10 [21] X\A is $\#\alpha rg - closed$ set in X. Therefore A is $\#\alpha rg - open$ set in X.

The converse of the theorem need not be true as seen from the following example.

Example 2.14: Let X = {a, b, c, d} be with topology $\tau = \{X, \phi, \{c\}, \{a, b\}\{a, b, c\}\}$ then the set {a} is $\#\alpha rg - open$ but not $\alpha - open$ set in X.

Theorem 2.15: If a subset A of X is $\#\alpha rg - open$ then it is gp-open but not conversely.

Proof: Let A be $\#\alpha rg - open$ set in a space X. Then X\A is $\#\alpha rg - closed$ set in X then by theorem 3.12 [21] X\A is gp-closed set in X. Therefore A is gp-open in X.

The converse of the theorem need not be true as seen from the following example.

Example 2.16: Let X ={a,b,c,d} be with the topology $\tau = \{X, \phi, \{a, b\}\}$ then the set A={a,d} is gp-open but not $\#\alpha rg - open$ set in X.

Theorem 2.17: If a subset A of a space X is $\#\alpha rg - open$ then it is $\alpha g - open$.

Proof: Let A be $\#\alpha rg - open$ in X. Then X\A is $\#\alpha rg - closed$ set in X. Then By theorem 3.14 [21] X\A is $\alpha g - closed$ set in X. Therefore A is $\alpha g - open$ in X.

The converse of the theorem need not be true as seen from the following example.

Example 2.18: Let X ={a,b,c} be with the topology $\tau = \{X, \phi, \{c\}, \{a, b\}\}$ the set A={a,c} is $\alpha g - open$ but not $\#\alpha rg - open$ set in X.

Theorem 2.19: If a subset A of a space X is $\#\alpha rg - open$ then it is gsp-open.

Proof: Let A be $\#\alpha rg - open$ in X. Then X\A is $\#\alpha rg - closed$ set in X. Then by theorem 3.16 [21] X\A is gsp-closed set in X. Therefore A is gsp-open in X.

The converse of the theorem need not be true as seen from the following example.

Example 2.20: Let X ={a, b, c} be with the topology $\tau = \left\{X, \phi, \{c\}, \{a, b\}\right\}$ then the set A={a,c} is gsp-open but not $\#\alpha rg - open$

Theorem 2.21: If A and B are $\#\alpha rg - open$ set in a space X. The $A \cap B$ is also $\#\alpha rg - open$ set in X.

Proof: If A and B are $\#\alpha rg - open$ sets in a space X. Then X\A and X\B are $\#\alpha rg - closed$ sets in a space X. By theorem 3.20 [21] (X\A)∪ $(X \backslash B)$ is also $\#\alpha rg - closed$ sets in X. Therefore $A \cap B$ is $\#\alpha rg - open$ set in X.

Theorem 2.22: The union of two $\#\alpha rg - open$ sets in X is not a $\#\alpha rg - open$ set in X.

Example 2.23: Let X = {a,b,c,d} be with topology $\tau = \left\{X, \phi, \{a\}, \{b\}, \{a, b\}\right\}$ then the set A={b,c} and B={b,d} are $\#\alpha rg - open$ set in X but $A \cup B = \{b. c, d\}$ is not $\#\alpha rg - open$ set in X.

Theorem 2.24: If a set A is $\#\alpha rg - open$ set in X then G=X whenever G is rw-open and $(\alpha\ int(A) \cup (X \backslash A)) \subseteq G.$

Proof: Suppose that A is $\#\alpha rg - open$ set in X. Let G be rw-open and $(\alpha int(A) \cup (X \backslash A)) \subseteq G.$ This implies $G^c \subseteq (\alpha int(A) U A^c)^c$=$(\alpha int(A))^c$ ∩A. That is $G^c \subseteq (\alpha int(A))^c \backslash A^c$. Thus $G^c \subseteq \alpha cl(A^c) \backslash A^c$ Now G^c is rw-closed and A^c is $\#\alpha rg - closed,$ by theorem 3.23 [21] it follows that G^c=ϕ. Hence G=X.

Theorem 2.25: Every Singleton point set in a space is either $\#\alpha rg - open$ or rw-closed.

Proof: Follows from theorem 3.27 [21]

3. #α-REGULAR GENERALIZED NEIGHBOURHOODS

Definition 3.1: Let X be a topological space and let x $\in X$. A subset N of x is said to be #αrg − Neighbourhood (briefly $\#\alpha rg - nbhd$) of x if and only if there exists a $\#\alpha rg - open$ set U such that x∈U⊂ N.

Definition 3.2: A subset N of space X is called a $\#\alpha rg - neighbourhood$ (briefly $\#\alpha rg - nbhd$) of A⊂ X if and only if there exists a $\#\alpha rg - open$ set U such that A⊂ $U \subset N$.

Theorem 3.3: Every neighbourhood of N of x $\in X$ is a #αrg − Neighbourhood of X.

Proof: Let N be a neighbourhood of point $x \in X$ by definition of neighbourhood, there exists an open set U such that x∈U⊂ N. Since every open set is $\#\alpha rg - open$ set, U is $\#\alpha rg - open$ set such that $x \in$U⊆ N. This implies N is #αrg − Neighbourhood of X.

The converse of the above theorem need not be true as seen from the following example.

Example 3.4: Let X={a, b, c, d} be with topology $\tau = \{X.\phi, \{c\}, \{a,b\}, \{a,b,c\}\}$ Then #αRGO(X) {X,ϕ,{a},{b},{c},{a,b},{a,b,c}}. The set {b, d} is $\#\alpha rg - nbhd$ of the point b, since the $\#\alpha rg - open$ set {b} is such that b∈ $\{b\} \subseteq \{b,d\}$. However the set {b, d} is not a nbhd of the point b. Since no open set U exists such that $b \in \{b\} \subseteq \{b,d\}$. However the set {b, d} is not a nbhd of the point b. Since no open set U exists such that b∈ $U \subseteq \{b,d\}$.

Theorem 3.5: If a subset N of a space X is $\#\alpha rg - open$ then N is $\#\alpha rg - nbhd$ of each of its point.

Proof: Suppose N is $\#\alpha rg - open$ let $x \in N$, For N is $\#\alpha rg - open$ set such that $x \in N \subseteq N$ Since 'x' is an arbitrary point of N, it follows that N is a $\#\alpha rg - nbhd$ of each of its points. The converse of the theorem is not true as seen from the following example.

Example 3.6: Let X={a, b, c, d} be with topology $\tau = \{X, \phi, \{c\}, \{a,b\}, \{a,b,c\}\}$ then $\#\alpha RGO(X) = \{X, \phi, \{a\}, \{b\}, \{c\}, \{a,b,c\}\}$ The set {b,c} is a $\#\alpha rg - nbhd$ of the point b. Since the $\#\alpha rg - open$ set {b} is such that b∈ $\{b\} \subset \{b,c\}$. Also the set {b,c} is $\#\alpha rg - nbhd$ of the point {c} since the $\#\alpha rg - open$ set {c} is such that $c \in \{c\} \subseteq \{b,c\}$, That is {b,c} is a $\#\alpha rg - nbhd$ of each of its points. However the set {b,c} is not $\#\alpha rg - open$ set in X.

Theorem 3.7: If F is a $\#\alpha rg - closed$ subset of X and $x \in F^c$ then there exists a $\#\alpha rg - nbhd$ N of x such that N∩ $F = \phi$.

Proof: Let F be $\#\alpha rg - closed$ subset of X and x∈ F^c then F^c is $\#\alpha rg - open$ set of X. So by theorem 3.5 F^c contains a $\#\alpha rg - nbhd$ of each of its points. Hence there exists a #αrg − nbhd.N of x such that $N \subseteq F^C$. Hence $N \cap F = \phi$

Definition 3.8: Let x be a point in a space X. The set of all $\#\alpha rg - nbhd$ of x is called $\#\alpha rg - nbhd$ system at X and is denoted by $\#\alpha rg - N(X)$.

Theorem 3.9: Let X be a topological space and for each x∈ X. $\#\alpha rg - N(x)$ be the collection of all $\#\alpha rg - nbhds$ of x. Then we have the following results.

(i) $Vx \in X, \ \#\alpha rg - N(x) \neq \phi$
(ii) $N \in$ #αrg-N(x) ⇒ x∈N
(iii) $N \in$ #αrg-N(x), $N \subset M \Rightarrow M \in$ #αrg-N(x)
(iv) $N \in$ #αrg-N(x), $M \in$ #αrg-N(x) ⇒ N∩ $M \in$ #αrg-N(x)
(v) $N \in$ #αrg-N(x)⇒there exists M∈ #αrg-N(x) such that M⊂ N and $M \in$ #αrg-N(y) For every y∈ M.

Proof:

(i) Since X is a $\#\alpha rg - open$ set, it is $\#\alpha rg - nbhd$ of every $x \in X$. Hence there exists atleast one $\#\alpha rg - nbhd$ (namely X) for each $x \in X$. Hence $\#\alpha rg - N(x) \neq \phi$ for every $x \in X$.
(ii) If $N \in$ #αrg-N(x), then N is a $\#\alpha rg - nbhd$ of x. So by the definition of $\#\alpha\, rg - nbhd$, x∈ N.
(iii) Let $N \in$ #αrg-N(x) $and \ N \subset M$. Then there is a #αrg-open set U such that x∈U⊂ N since $N \subset M$, x∈ U⊂ N and so M is $\#\, \alpha rg - nbhd$ of x. Hence M∈$\#\alpha rg - N(x)$.
(iv) Let N∈ #αrg-N(x) and M∈#αrg-N(x). Then by definition of $\#\, \alpha rg - nbhd$ there exists #αrg-open sets U_1 and U_2 such that x∈ $U_1 \subset N$ and x∈$U_2 \subset M$. Hence x∈$U_1 \cap U_2 \subset N \cap M$. Since $U_1 \cap_2$ is $\#\alpha rg - open\ set$, N∩ M is a $\#\, \alpha rg - nbhd$ of x. Hence N∩M∈ $\alpha gr - N(x)$.

(v) If N∈ $\#\alpha rg - N(x)$ then there exists a $\#\,\alpha rg - open$ set M. Such that x∈ $M \subset N$. Since M is a $\#\alpha rg - open\ set$, it is $\#\alpha rg - nbhd$ of each of its points. Therefore M∈ $\#\alpha rg - N(y)$ for every y∈ M.

4. *#α-REGULAR GENERALIZED* CLOSURE AND THEIR PROPERTIES.

Definition 4.1: For a subset A of X $\#\,\alpha rg$-cl(A)= ∩{F:A⊆ F, F is $\#\,\alpha rg - closed\ inX\}$

Definition 4.2: Let (X,τ) be a topological space and $\tau_{\#\alpha rg}$={V⊆X, $\#\,\alpha rg - cl(X\backslash V)$=X\V).

Remark 4.3: If A⊆ X is $\#\,\alpha rg - closed$ then $\#\,\alpha rg - cl(A) = A$. But the converse is not time, it is seen from the following example.

Example 4.4: Let X = {a,b,c,d} be with topology. $\tau = \{X, \phi, \{a\}, \{b\}, \{a, b\}\}$ Let A={b, c} then $\#\,\alpha rg$-cl(A) =A but A is not $\#\,\alpha rg - closed$.

Remark 4.5: $\#\,\alpha rg - cl(\phi) = \phi$ and $\#\,\alpha rg - cl(X) = X$.

(i) A ⊆$\#\,\alpha rg - cl(A)$ for every subset A of X.
(ii) Let A and B be subsets of X if A⊆ B then $\#\,\alpha rg$-cl(A)⊆ $\#\alpha rg$-cl(B).

Theorem 4.6: Suppose $\tau_{\#\alpha rg}$ is a topology. If A is $\#\,\alpha rg$-closed in (X,τ) then A is $\alpha - closed\ in$ (X, $\tau_{\#\alpha rg}$).

Proof: Suppose A is $\#\,\alpha rg$-closed in (X,τ), $\#\,\alpha rg - cl(A) = A$. This implies X\A∈ $\tau_{\#\alpha rg}$. That is X\A is $\alpha - open\ in\ \left(X, \tau_{\#\alpha rg}\right)$. Hence A is $\alpha - closed\ in\ (X, \tau_{\#\alpha rg})$

Theorem 4.7: For any x∈ X, $x \in \#\,\alpha rg - cl(A)$ if and only if V∩ $A \neq \phi$ for every $\#\,\alpha rg - open\ set$ V containing x.

Proof:
Necessity: Let x∈ $\#\,\alpha rg - cl(A)$. Suppose there exists a $\#\alpha rg - open$ set V containing x such that V∩ $A = \phi$. Since A⊆X\V, $\#\,\alpha rg - cl(A) \subseteq \backslash V$ this implies that x∉ $\#\,\alpha rg - cl(A)$a contradiction.

Sufficiency: Suppose x∉ $\#\,\alpha rg - cl(A)$, then there exists a $\#\,\alpha rg$ −closed subset F containing A such that x∉F, Then x∈X\F and X\F is $\#\alpha rg - open$. Also (X\F) ∩ $A = \phi$ a contradiction.

Theorem 4.8: Let A and B be subsets of X then $\#\,\alpha rg$-cl(A∩ B) ⊆ $\#\,\alpha rg - cl(A)$ ∩$\#\,\alpha rg - cl(B)$.

Proof: Since A∩ B ⊆A and B, by Remark 4.5 $\#\,\alpha rg - cl($A∩ $B)$ ⊆ $\#\alpha\ rg$-cl(A) and $\#\,\alpha rg - cl($A∩ $B)$ ⊆ $\#\,\alpha rg$-cl(B) thus $\#\,\alpha rg - cl($A∩ $B)$ ⊆ $\#\,\alpha rg$-cl(A) ∩ $\#\,\alpha rg - cl$ (B).

Remark 4.9: $\#\,\alpha rg - cl$(A) ∩ $\#\,\alpha rg$-cl(B)⊄$\#\,\alpha rg$-cl(A∩ B) it is seen from the following example.

Example 4.10: Let X ={a, b, c, d} be with topology $\tau = \{X, \phi, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}\}$. Let A={a} and B={d} $A \cap B = \emptyset$ $\#\,\alpha rg$-cl(A)={a,d} and $\#\,\alpha rg$-cl(B)={d} Then $\#\,\alpha rg$-cl(A) ∩ $\#\,\alpha rg$-cl(B) ={d}⊄$\#\,\alpha rg$-cl($A \cap B$)

Theorem 4.11: If A and B are $\#\,\alpha rg$-closed sets then $\#\,\alpha rg$-cl($A \cup B$) = $\#\,\alpha rg$-cl(A)∪ $\#\,\alpha rg$-cl(B).

Proof: Let A and B be $\#\,\alpha rg$-closed in X. Then $A \cup B$ is also $\#\,\alpha rg$-closed. Then $\#\,\alpha rg$-cl($A \cup B$)= $A \cup B$= $\#\,\alpha rg$-cl(A)∪ $\#\,\alpha rg$-cl(B).

Definition 4.12: For any A⊆ X, $\#\,\alpha rg - int(A)$ is defined as the union of all $\#\,\alpha rg$-open set contained in A.

Theorem 4.13: (X\$\#\,\alpha rg - int(A)$) = $\#\,\alpha rg$-cl(x\A)

Proof: Let x∈ X\$\#\,\alpha rg - int(A)$ then x ∉ $\#\alpha rg - int(A)$ That is every $\#\alpha rg - open$ set B containing x is such that B $\not\subset A$. This implies that every $\#\alpha rg - open$ set B containing x intersects X\A. By theorem 4.6 x∈$\#\,\alpha rg$-cl(X\A). Hence (X\$\#\,\alpha rg$-int (A))⊆ $\#\,\alpha rg$-cl(X\A). Conversely let x∉$\#\,\alpha rg$-cl(X\A). Then every $\#\,\alpha rg$-open set U containing x intersects X\A. That is every $\#\,\alpha rg$-open set U containing x is such that U⊄A, implies x∉$\#\,\alpha rg$-int(A). Hence $\#\,\alpha rg$-cl(X\A)⊆(X\$\#\,\alpha rg$-int (A)) Thus (X\$\#\,\alpha rg$-int (A))=$\#\,\alpha rg$-cl(X\A).

CONCLUSION

In this paper we study #αrg- open sets and their basic properties relationship with some generalized sets in topological space also we have discuss #αrg-neighbourhood and #αrg-closure and their properties..

REFERENCES

1. Benchalli, S.S., and Wali. R.S., on RW-Closed sets in topological spaces, Bull, Malays, Math.Sci.Soc(2) 30(2)(2007), 99-110.
2. Bhattacharyya. P. And Lahiri. B.K. Semi-generalized closed sets in topology, Indian J. Math 29(1987), 376-382.
3. Buswas, N., On Characterization of semi-continuous functions, Atti Accad, Naz. Lincei Rend, Cl. Sci. Fis. Mat. Natur. 48(8) (1970), 399-402.
4. Cameron, D.E., Properties of S-closed spaces, Proc. Amer Math.Soc.72 (1978), 581-586.
5. Dontchev. J and Noiri. T Quasi-normal spaces and πg-closed sets, Acta Math. Hungar, 89(3)(2000), 211-219.
6. Gnanmbal Y., On generalized pre-regular closed sets in topological spaces, Indian J. Pure App. Math. 28 (1997), 351-360.
7. Gnanambal. Y. And Balachandran. K., On gpr-continuous functions in topological spaces, Indian J. Pure Appl. Math. 30(6) (1999), 581-593.
8. Levine. N., Semi-open sets and semi-continuity in topological spaces, Amer, Math. Monthly, 70(1973), 36-
9. Levine. N., Generalized closed sets in topology, Rend Circ. Mat. Palermo 19(1970), 89-96.
10. Maki. H. Devi. R and Balachandran, K., Associated topologies of generalized α-cloed and α- generalized closed sets, Mem.Sci. Kochi Univ. Ser. A. Math 15(1994), 51-63.
11. Mashhour. A.S., ABD. El-Monsef. M.e. and El-Deeb S.N., On pre continuous mappings and weak pre-continuous mappings, Proc Math, Phys. Soc. Egypt 53(1982), 47-53.
12. Nagaveni. N., Studies on Generalizations of Homeomorphisms in Topological Spaces., Ph.D. Thesis, Bharathiar University, Coimbatore, 1999.
13. Palaniappan N., and Rao. K.c., Regular generalized closed sets, Kyungpook Math. J. 33(1993), 211-219.
14. Palaniappan N, Pious Missier S and Antony Rex Rodrigo αgp -closed sets in Topological Spaces, Acta Ciencia Indica Vol. XXXI M, No.1,243 (2006).
15. Park. J.K. and Park, J.H., Mildly generalized closed sets, almost normal and mildly normal spaces, Chaos Solitions and Fractals 20(2004), 1103-1111.
16. Pushpalatha. A., Studies on Generalizations of Mappings in Topological Spaces, Ph.D. Thesis, Bharathiar University, Coimbatore, 2000.
17. Sundaram. P and Shiek John. M., On w-closed sets in topology, Acta Ciencia Indica 4(2000), 389-392.
18. Stone. M., Application of the theory of Boolean rings to general topology, Trans. Amer .Math. Soc.41 (1937), 374-481.
19. Syed Ali Fathima S and Mariasingam M on #regular generalized closed sets in Topological Spaces, International Journal of Mathematical Archive -2(11),2011 2497-2502.
20. Syed Ali Fathima S and Mariasingam M on #regular generalized open sets in Topological Spaces, International Journal of Computer Applications (0795-8887) Volume 42-No.7 March 2012.
21. Thilaga Leelavathi S and Mariasingam M on **#α-regular generalised closed in** Topological Spaces, International Journal of Mathematical Trends and Technology (IJMTT) Volume 56 Number 8 – April 2018.
22. Tong.J., Weak almost continuous mapping and weak nearly compact spaces, Boll. Un.Mat.Ital. (1982), 385-391.
23. Thakur C.K. Raman, Vidyottamma Kumari and Sharma M.K α--Generalized & α * - Separation Axioma for Topological Spaces, IOSR Journal of Mathematics Volume 10, Issue 3 Ver.VI (May-Jun 2014) PP 32-36.

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