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ON (1, 2)-GENERALIZED SEMI-PRE-REGULAR – CLOSED SETS IN BITOPOLOGICAL SPACES

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ABSTRACT- This dissertation entitled "on (1,2)-generalized semi-pre-regular closed sets in bitopological spaces" discuss the concepts of (1,2)-generalized pre-regular closed sets,(1,2)-generalized pre-regular open sets ,(1,2)-generalized pre-regular continous functions and (1,2)-generalized pre-regular irresolute functions and their abstract properties in bitopological spaces.Finally (1,2)-generalized semi-pre-regular closed sets in defined and we have discussed some of its properties.

Keyword- [Generalized Semi-Pre-Regular, Closed Sets, Bitopological Spaces]

(1, 2)- GENERALIZED SEMI-PRE-REGULAR –CLOSED SETS:

DEFINITION:

A subset A of (X,τ_1, τ_2)is called (1,2)-generalized semi-pre-regular closed (briefly(1,2)-gspr-closed)if (1,2)-spcl(A) ⊂U,whenever A⊂U and U∊(1,2)-RO(X).The family of all (1,2)-gspr-closed sets of X is denoted by (1,2)-GSPRCL(X).

1. THEOREM

i) Every (1,2)closed set is (1,2)-gspr-closed set.
ii) Every (1,2)-rg-closed set is (1,2)-gspr-closed set.
iii) Every (1,2)-gs-closed set is (1,2)-gspr-closed set.
iv) Every (1,2)-sg-closed set is (1,2)-gspr-closed set.
v) Every (1,2)α-closed set is (1,2)-gspr-closed set.
vi) Every (1,2)-pg-closed set is (1,2)-gspr-closed set.
vii) Every (1,2)-gp-closed set is (1,2)-gspr-closed set.
viii) Every (1,2)-αg-closed set is (1,2)-gspr-closed set.
ix) Every (1,2)-β-closed set is (1,2)-gspr-closed set.

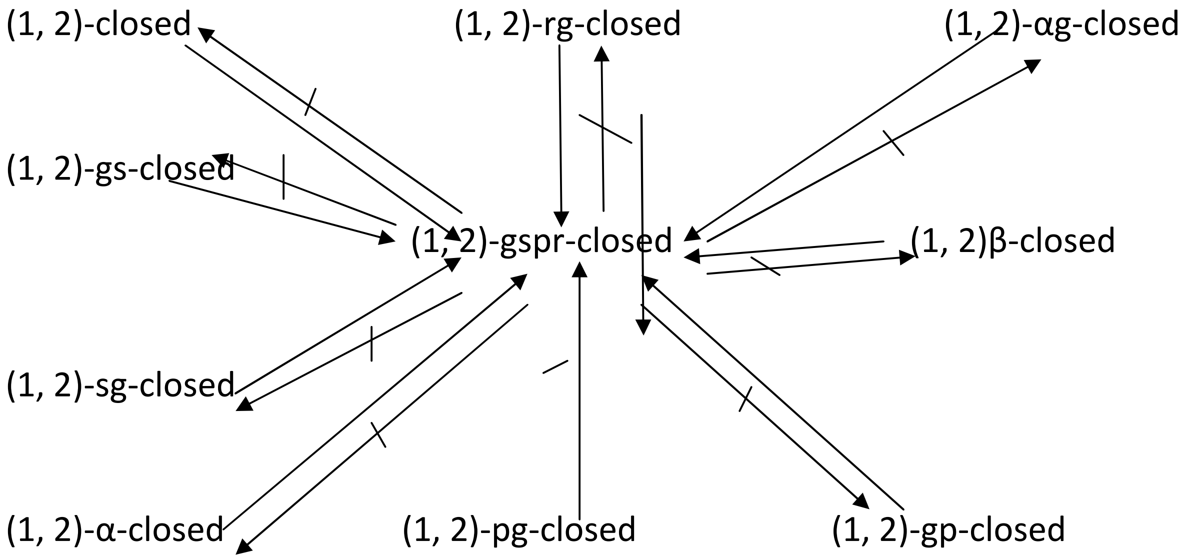
PROOF:

i) Let A be a (1,2)closed set.
To Prove:A is (1,2)-gspr-closed set.
Suppose U is a (1,2)-regular open set,such that A⊂ U.
Since A is a (1,2)closed set,(1,2)cl(A)=A⊂U.

∴(1,2)-spcl(A) ⊂ (1,2)cl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
ii)Assume that A is a (1,2)-rg-closed set.
Let U be a (1,2)-regular open set,such that A⊂U.
Since A is a (1,2)-rg-closed set,(1,2)-αcl(A) ⊂U.
∴(1,2)-spcl(A) ⊂(1,2)-αcl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
iii) Suppose U is a (1,2)-regular open set,such that A⊂U.
Every regukar open set is α-open,U is a (1,2)-α-open.
Since A is a (1,2)-gs-closed set,(1,2)-scl(A) ⊂U.
∴(1,2)-spcl(A) ⊂ (1,2)-scl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
iv) Assume that A is a (1,2)-sg-closed set.
Let U be a (1,2)-regular open set,such that A⊂U.
Since A is a (1,2)-sg-closed set,(1,2)-scl(A) ⊂U.
∴(1,2)-spcl(A) ⊂(1,2)-scl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
v) Let A be a (1,2)-αclosed set.
To Prove:A is (1,2)-gspr-closed set.
Suppose U is a (1,2)-regular open set,such that A⊂U.
Since A is a (1,2)-αclosed set,(1,2)-αcl(A)=A⊂U.
∴(1,2)-spcl(A) ⊂(1,2)-αcl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
vi) Assume that A is a (1,2)-pg-closed set.
Let U be a (1,2)-regular open set,such that A⊂U.
Every regular open set is pre-open,U is a (1,2)-pre-open.
Since A is a (1,2)-pg-closed set,(1,2)-pcl(A) ⊂U.
∴(1,2)-spcl(A) ⊂(1,2)-pcl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
vii) Suppose U is a (1,2)-regular open set,such that A⊂U.
Every regular open set is α-open,U is a (1,2)-α-open.
Since A is a (1,2)-gpclosed set,(1,2)-pcl(A) ⊂U.
∴(1,2)-spcl(A) ⊂(1,2)-αcl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
viii)) Let A be a (1,2)-αg-closed set.
To Prove:A is (1,2)-gspr-closed set.
Suppose U is a (1,2)-regular open set, such that A⊂U.
Every regular open set is α-open,U is a (1,2)-α-open.
Since A is a (1,2)-αg-closed set,(1,2)-αcl(A) ⊂U.
∴(1,2)-spcl(A) ⊂(1,2)-αcl(A) ⊂U

(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.
ix)) Assume that A is a (1,2)-semi-pre-closed set.
Let U be a (1, 2)-regular open set,such that A⊂U.
Then(1, 2)-βcl(A)=A⊂U.
∴(1,2)-βcl(A) ⊂U.
(ie)(1,2)-spcl(A) ⊂U.
Thus,A is a (1,2)-gspr-closed set.

ALL THE ABOVE RESULTS CAN BE REPRESENTED BY THE FOLLOWING DIAGRAM:



2. REMARK

Converse of the above theorem need not always be true as shown by the following example.

EXAMPLE:

i)Let X ={a,b,c}
τ_1={X,∅, $\{a\}, \{b\}, \{a, b\}$}
Closed sets of X with respect to τ_1={X,∅, $\{c\}, \{a, c\}, \{b, c\}$}
τ_2={X,∅, $\{a\}$}
Closed sets of X with respect to τ_2={X,∅, $\{b, c\}$}
$\tau_1\ \tau_2$={ X,∅, $\{a\}, \{b\}, \{a, b\}$}
Closed sets of X with respect to $\tau_1\ \tau_2$ ={X,∅, $\{c\}, \{a, c\}, \{b, c\}$}

To find (1, 2)-regular –open sets in (X,τ_1, τ_2):

A	$\tau_1\tau_2$ – cl(A)	τ_1 –int($\tau_1\tau_2$-cl(A))	A= τ_1 –int($\tau_1\tau_2$-cl(A))
{a}	{a,c}	{a}	Yes
{b}	{b,c}	{b}	Yes
{c}	{c}	∅	No
{a,b}	X	X	No
{a,c}	{a,c}	{a}	No
{b,c}	{b,c}	{b}	No

∴{ X,∅, $\{a\},\{b\}$} are (1,2)regular –open sets in (X,τ_1,τ_2).

To find (1,2)-semi pre-closed sets in (X,τ_1,τ_2):

A	$\tau_1\tau_2$-int(A)	$\tau_1\tau_2$–cl ($\tau_1\tau_2$–int(A))	$\tau_1\tau_2$–int($\tau_1\tau_2$-cl($\tau_1\tau_2$ –int(A)))	$\tau_1\tau_2$–int($\tau_1\tau_2$-cl($\tau_1\tau_2$ –int(A)))--A
{a}	{a}	{a,c}	{a}	Yes
{b}	{b}	{b,c}	{b}	Yes
{c}	∅	∅	∅	Yes
{a,b}	{a,b}	X	X	No
{a,c}	{a}	{a,c}	{a}	Yes
{b,c}	{b}	{b,c}	{b}	Yes

Thus, {X,∅,$\{a\},\{b\},\{c\},\{a,c\},\{b,c\}$} are (1,2)-semi pre-closed sets in (X,τ_1,τ_2).

To find (1,2)gspr-closed sets in (X,τ_1,τ_2):

Let A ={a}
(1,2)-spcl(a)={a}
(1,2)-regular-open sets containing {a}are{a},X.
{a}—{a},{a}----X.
Which implies that {a} is(1,2)-gspr-closed set.
Similarly we can prove that {{b},{c},{a,b},{a,c},{b,c}} are (1,2)gspr-closed sets in (X,τ_1,τ_2).
Hence {X,∅,$\{a\}$,{b},{c},{a,b},{a,c},{b,c}} are (1,2)gspr-closed sets in (X,τ_1,τ_2).

(1,2)gspr-closed sets ---(1,2)-closed sets in (X,τ_1,τ_2):

Let A={a}
(1,2)cl({a})={a,c}
Let A ={b}
(1,2)cl({b})={b,c}
Let A={c}
(1,2)cl({c})={c}
Let A={a,b}
(1,2)cl({a,b})=X
Let A={a,c}
(1,2)cl({a,c})={a,c}
Let A={b,c}
(1,2)cl({b,c})={b,c}
Ie.,{{a},{b},{a,b}} are not (1,2)closed but are(1,2)gspr-closed.
Thus,{X,∅,$\{c\},\{a,c\},\{b,c\}$} are (1,2)closed sets in (X,τ_1,τ_2).

BIBLIOGRAPY

[1]. D.Andrijevic,semi pre-open Mat.Vesnik 38(1)(1986),24-32.
[2]. S.P.Arya and T.M.Nour,Characterization of S-normal spaces Indian J.Pure apl.Math.21(8)(1990),717-19.
[3]. P.Bhattacharyaa and B.K.Lahiri,semi generalized closed sets in topological spaces,Indian J.Math,29(1987),375-82.
[4]. K.Balachandran and Arockia Rani,on generalized precontinous map.
[5]. Balachandran, Pairwise pre-C_j bitopological spaces j=0,1,2.,Aetaciencia Indica XXXI M,1(2005),267-271.

[6]. J.Dontchev and M.Ganster,on covering space with semi-regular sets,Kicerehe.Mat.45(1996),229-245.

[7]. J.Dontchev,On generalized semi pre-open sets,Mem.Fac.Sci.Kochi Univ.Ser.A,Math-16(1995),35-48.

[8]. Y.Gnanambal ,studies on generalized pre-regular closed sets,in topological spaces Indian J.Pure appl.Math.28(3)(1997),351-360.

[9]. J. C. Kelly, Bitopological spaces,Proc.Londan Math.Soc.13(1963),71-89.

[10]. M.Lellis Thivagar,Generalization of pairwise α-continuous functions,Pure and Applied Mathematics and Sciences,XXXIII,1-2(1991),55-63.

[11]. M. Lellis Thivagar and R. Raja rajeswari,Bitopological Ultra Spaces.South East Bullitein of Mathematics,29(2006),to appear.

[12]. G. B. Navalagi, M. Lellis Thivagar and R.Raja rajeswari,Generalization of (1,2)-semi-pre-closed sets in bitopological spaces,Mathematical forum XXVII(2006)to appear.

[13]. G. B. Navalagi, M. Lellis Thivagar and R.Raja rajeswar and S.Athisaya Ponmani On (1,2)-α-hyperconnected spaces, International Journal of Mathematics and Analy,to appear.

[14]. R. L. Prasad S. K .Roy, T. A. Desnavi and S. Kumar, ij-pre-open and pre-closed subjects in bitopological spaces, Acta ciencia Indica,XXX.M,4(2004),757-760.

[15]. P. Sundram and M.Sheik John,g^*-closed sets in bitoplogical spaces, Indian.J.Pure.App.Math35(1)(2004),71-80.Type equation here.