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$(1,2)^*$-δgp **Continuous Function in Bitopological Spaces**

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Abstract

The aim of this paper is to introduce a new class of functions called $(1,2)^*$-δgp continuous functions. We obtain several characterization and some theirproperties. Also we investigate its relationship with other types of functions in bitopological spaces. Further we introduce and study a new class of functions namely $(1,2)^* - \delta gp$ irresolute functions.

Keywords:

$(1,2)^*$-δgp closed sets, $(1,2)^*$-δgp open sets, $(1,2)^*$-δgp Continuous and $(1,2)^*$-δgp irresolute..

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1. Introduction

In 1963, Kelley [3] initiated the study of bitopological spaces. A nonempty set X equipped with two topological spaces τ_1 and τ_2 is called a bitopological spaces and is denoted by (X,τ_1,τ_2). M. Lellis Thivagar and O.Ravi [6] introduced a new type of generalized sets called $(1,2)^*$-semi generalized closed sets and a new class of generalized functions called $(1,2)^*$-semi generalized continuous maps in 2006. S.S. Benchalli and J.B.Toranagatti [1] introduced delta generalized pre-closed sets in topological space. The purpose of this present paper is to define a new class of generalized continuous function called $(1,2)^*$-δgp continuous and investigate their relationships to other generalized continuous functions. We further study a new class of functions namely $(1,2)^*$-δgp irresolute.

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2. Preliminaries

Throughout this paper (X,τ_1,τ_2) (or briefly X) represent bitopological spaces on which no separation axioms are assumed unless otherwise mentioned.

Definition 2.1. [8] A subset B of a bitopological space (X,τ_1,τ_2) is called $\tau_1\tau_2-$open if $B=U_1\cup U_2$ where $U_1\in\tau_1$ and $U_2\in\tau_2$. The complement of $\tau_1\tau_2-$open is called $\tau_1\tau_2-$closed.

Remark 2.2. [8] $\tau_1\tau_2-$open subset of X need not necessarily from a topology.

Definition 2.3. [8] A subset A of a bitopological space (X,τ_1,τ_2) is called

(i) The $\tau_1\tau_2-$closure of A, denoted by $\tau_1\tau_2$-cl(A) is defined by $\tau_1\tau_2-$closure (A) $=\cap\{F/ A\subseteq F$ and F is $\tau_1\tau_2-$closed$\}$.

(ii) The $\tau_1\tau_2-$interior of A, denoted by $\tau_1\tau_2$-int(A) is defined by $\tau_1\tau_2-$interior (A) $=\cup\{F/ A\subseteq F$ and F is $\tau_1\tau_2-$open$\}$.

Definition 2.4. A subset A of a bitopological space (X,τ_1,τ_2) is called

(i) $(1,2)^*$-pre-open [8] if $A\subseteq\tau_1\tau_2\text{-int}(\tau_1\tau_2\text{-cl}(A))$ and $(1,2)^*$-pre-closed if $\tau_1\tau_2\text{-cl}(\tau_1\tau_2\text{-int}(A))\subseteq A$.

(ii) $(1,2)^*$-b open [4] if $A\subseteq(\tau_1\tau_2\text{-cl}(\tau_1\tau_2\text{-int}(A)))\cup(\tau_1\tau_2\text{-int}(\tau_1\tau_2\text{-cl}(A)))$ and $(1,2)^*$-b closed if $(\tau_1\tau_2\text{-cl}(\tau_1\tau_2\text{-int}(A)))\cap(\tau_1\tau_2\text{-int}(\tau_1\tau_2\text{-cl}(A)))\subseteq A$.

(iii) $(1,2)^*$- regular-open [12] if $A=\tau_1\tau_2\text{-int}(\tau_1\tau_2\text{-cl}(A))$ and $(1,2)^*$- regular closed if $A=\tau_1\tau_2\text{-cl}(\tau_1\tau_2\text{-int}(A))$.

The $(1,2)^*$-pre-closure of a subset A of X, denoted by $(1,2)^*$-pcl(A) is the intersection of all $(1,2)^*$-pre-closed sets containing A. The $(1,2)^*$-pre-interior of a subset A of X, denoted by $(1,2)^*$-pint(A) is the union of $(1,2)^*$-pre-open sets contained in A.

Definition 2.5. [9] The $(1,2)^*$-δ interior of a subset A of X is the union of all $(1,2)^*$- regular open set of X contained in A and is denoted by $(1,2)^*$-δint(A). The subset A is called $(1,2)^*$-δ open if $A=(1,2)^*$-δint(A), ie.a set is $(1,2)^*$-δ open if it is the union of (1, 2)* -regular open sets. The complement of a $(1,2)^*$-δ open is called $(1,2)^*$-δ closed. Alternatively, a set $A\subseteq(X,\tau_1,\tau_2)$ is called $(1,2)^*$-δ closed if $A=(1,2)^*$-δcl(A), where $(1,2)^*\text{-}\delta\text{cl}(A)=\{x\in X:\tau_1\tau_2\text{-int}(\tau_1\tau_2\text{-cl}(A))\cap A=\phi, U\in\tau_1\tau_2 \text{ and } x\in U\}$.

Definition 2.6. A subset A of a bitopological space (X,τ_1,τ_2) is called

(i) $(1,2)^*$- generalized closed set (briefly $(1,2)^*$-g closed) [11] if $\tau_1\tau_2$-cl(A)$\subseteq$U whenever $A\subseteq U$ and U is $\tau_1\tau_2-$open in X.

(ii) $(1,2)^*$- generalized b-closed set (briefly $(1,2)^*$-gb closed) [13] if $\tau_1\tau_2$-bcl(A)$\subseteq$U whenever $A\subseteq U$ and U is $\tau_1\tau_2-$open in X.

(iii) $(1,2)^*$- generalized pre-closed set (briefly $(1,2)^*$-gp closed) [14] if $\tau_1\tau_2$-pcl(A)$\subseteq$U whenever $A\subseteq U$ and U is $\tau_1\tau_2-$open in X.

(iv) $(1,2)^*$- generalized pre regular closed set (briefly $(1,2)^*$-gpr closed) [10] if $\tau_1\tau_2$-pcl(A)$\subseteq$U whenever $A\subseteq U$ and U is $(1,2)^*$- regular open in X.

(v) $(1,2)^*$-δ generalized closed set (briefly $(1,2)^*$-δg closed) [9] if $\tau_1\tau_2$-δcl(A)$\subseteq$ U whenever A $\subseteq$ U and U is $(1,2)^*$- open in X .

(vi) $(1,2)^*$- delta generalized pre-closed (briefly, $(1,2)^*$-δgp closed) [9] if $\tau_1\tau_2$-pcl(A)$\subseteq$ U whenever A $\subseteq$ U and U is $(1,2)^*$-δ open in X .

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

Definition 2.7. Recall that function $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ is called

(i) $(1,2)^*$- continuous [7] if $f^{-1}(V)$ is $(1,2)^*$- closed in (X,τ_1,τ_2) for every closed V of (Y,σ_1,σ_2).

(ii) $(1,2)^*$- generalized continuous (briefly $(1,2)^*$-g continuous) [6] if $f^{-1}(V)$ is $(1,2)^*$-g closed in (X,τ_1,τ_2) for every closed V of (Y,σ_1,σ_2).

(iii) $(1,2)^*$- generalized b continuous (briefly $(1,2)^*$-gb continuous) [13] if $f^{-1}(V)$ is $(1,2)^*$-g closed in (X,τ_1,τ_2) for every closed V of (Y,σ_1,σ_2).

(iii) $(1,2)^*$-b continuous (briefly $(1,2)^*$-b continuous) [2] if $f^{-1}(V)$ is $(1,2)^*$-b closed in (X,τ_1,τ_2) for every closed V of (Y,σ_1,σ_2).

(iv) $(1,2)^*$- generalized pre continuous (briefly $(1,2)^*$-gp continuous) [5] if $f^{-1}(V)$ is $(1,2)^*$-gp closed in (X,τ_1,τ_2) for every closed V of (Y,σ_1,σ_2).

(v) $(1,2)^*$- generalized pre regular continuous (briefly (1, 2)* - gpr continuous) [11] if $f^{-1}(V)$ is (1, 2)* - gpr closed in (X,τ_1,τ_2) for every closed V of (Y,σ_1,σ_2).

3. $(1,2)^*$-δgp Continuous function

We introduce the following definitions.

Definition 3.1. A function $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ is said to be $(1,2)^*$-δgp continuous, if $f^{-1}(V)$ is $(1,2)^*$-δgp closed set in X for every $\sigma_1\sigma_2$ − closed set V in Y .

Example 3.2. Let $X=Y=\{a,b,c\}$, $\tau_1=\{\phi,\{a\},X\}$, $\tau_2=\{\phi,\{b\},\{a,b\},X\}$, $\sigma_1=\{\phi,\{b\},Y\}$ and $\sigma_2=\{\phi,\{a\},Y\}$. Let a map $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be defined by $f(a)=b$, $f(b)=a$, $f(c)=c$. Then f is $(1,2)^*$-δgp continuous.

Theorem 3.3. Every $(1,2)^*$-continuous map is $(1,2)^*$-δgp continuous.

Proof. Let $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be $(1,2)^*$-continuous. Let V be $\sigma_1\sigma_2$- closed set in Y. Since f is $(1,2)^*$-continuous, $f^{-1}(V)$ is $\tau_1\tau_2$ − closed. But every $\tau_1\tau_2$ − closed set is $(1,2)^*$-δgp closed. Therefore $f^{-1}(V)$ is $(1,2)^*$-δgp closed. Hence f is $(1,2)^*$-δgp continuous.

Remark 3.4. The converse of the above theorem is not true in general as shown in the following example.

Example 3.5. Let $X=Y=\{a,b,c\}$, $\tau_1=\{\phi,\{a\},X\}$, $\tau_2=\{\phi,\{b\},\{a,c\},X\}$, $\sigma_1=\{\phi,\{a\},Y\}$ and $\sigma_2=\{\phi,\{a\},\{a,c\},Y\}$. Let a map $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be defined by $f(a)=c$, $f(b)=a$, $f(c)=b$. Clearly f is $(1,2)^*$-δgp continuous but not $(1,2)^*$-continuous because $f^{-1}(\{b\})=\{c\}$ is not $\tau_1\tau_2$ closed.

Theorem 3.6. Every $(1,2)^*$-pre continuous map is $(1,2)^*$-δgp continuous.

Proof. Let $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be $(1,2)^*$-pre continuous. Let V be $\sigma_1\sigma_2$ −closed set in Y. Since f is (1, 2)*-pre continuous, $f^{-1}(V)$ is (1, 2)* -pre closed. But every $(1,2)^*$-pre closed set is $(1,2)^*$-δgp closed. Therefore $f^{-1}(V)$ is $(1,2)^*$-δgp closed. Hence f is $(1,2)^*$-δgp continuous.

Remark 3.7. The converse of the above theorem is not true in general as shown in the following example.

Example 3.8. Let $X=Y=\{a,b,c,d\}$, $\tau_1=\{\phi,\{a\},\{a,b,c\},X\}$, $\tau_2=\{\phi,\{b\},\{a,b\},X\}$, $\sigma_1=\{\phi,\{a,d\},\{a,c,d\},Y\}$ and $\sigma_2=\{\phi,\{b\},\{b,c,d\},Y\}$. Let a map $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be defined by $f(a)=d$, $f(b)=c$, $f(c)=a$ and $f(d)=b$. Clearly f is $(1,2)^*$-δgp continuous but not $(1,2)^*$-pre continuous because $f^{-1}(\{b,c\})=\{b,d\}$ is not $(1,2)^*$-pre closed.

Theorem 3.9. Every $(1,2)^*$-gp continuous map is $(1,2)^*$-δgp continuous.

Proof. Let $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be $(1,2)^*$-gp continuous. Let V be $\sigma_1\sigma_2$ −closed set in Y. Since f is $(1,2)^*$-gp continuous, $f^{-1}(V)$ is $(1,2)^*$-gp closed. But every $(1,2)^*$-gp closed set is $(1,2)^*$-δgp closed. Therefore $f^{-1}(V)$ is $(1,2)^*$-δgp closed. Hence f is $(1,2)^*$-δgp continuous.

Remark 3.10. The converse of the above theorem is not true in general as shown in the following example.

Example 3.11. Let $X=Y=\{a,b,c\}$, $\tau_1=\{\phi,\{b\},\{a,b\},X\}$, $\tau_2=\{\phi,\{a\},\{a,c\},X\}$, $\sigma_1=\{\phi,\{b,c\},Y\}$ and $\sigma_2=\{\phi,\{a\},\{a,c\},Y\}$. Let a map $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be defined by $f(a)=b$, $f(b)=c$, $f(c)=a$. Clearly f is $(1,2)^*$-δgp continuous but not $(1,2)^*$-gp continuous because $f^{-1}(\{b\})=\{a\}$ is not $(1,2)^*$-gp closed.

Theorem 3.12. Every $(1,2)^*$-δgp continuous is $(1,2)^*$-gpr continuous.

Proof. Let $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be $(1,2)^*$-δgp continuous. Let V be $\sigma_1\sigma_2$ −closed set in Y. Since f is $(1,2)^*$-δgp continuous, $f^{-1}(V)$ is $(1,2)^*$-δgp closed. But every $(1,2)^*$-δgp closed set is $(1,2)^*$-gpr closed. Therefore $f^{-1}(V)$ is $(1,2)^*$-gpr closed. Hence f is $(1,2)^*$-gpr continuous.

Remark 3.13. The converse of the above theorem is not true in general as shown in the following example.

Example3.14. Let $X=Y=\{a,b,c\}$, $\tau_1=\{\phi,\{b\},\{a,c\},X\}$, $\tau_2=\{\phi,\{a\},\{b\},\{a,b\},\{b,c\},X\}$, $\sigma_1=\{\phi,\{a\},Y\}$ and $\sigma_2=\{\phi,\{a,b\},Y\}$. Let a map $f:(X,\tau_1,\tau_2)\to(Y,\sigma_1,\sigma_2)$ be defined by $f(a)=b$, $f(b)=c$, $f(c)=a$. Clearly f is $(1,2)^*$-gpr continuous but not $(1,2)^*$-δgp continuous because $f^{-1}(\{b,c\})=\{a,b\}$ is not $(1,2)^*$-δgp closed.

Remark 3.15. The following example shows that $(1,2)^*$-δgp continuous function is independent of $(1,2)^*$-b continuous function and $(1,2)^*$-gb continuous function.

Example 3.16. Let $X = Y = \{a, b, c, d\}$, $\tau_1 = \{\phi, \{b\}, \{a, b\}, X\}$, $\tau_2 = \{\phi, \{a\}, \{a, b, c\}, X\}$, $\sigma_1 = \{\phi, \{b, c\}, \{a, b, c\}, Y\}$ and $\sigma_2 = \{\phi, \{c\}, \{a, c, d\}, Y\}$. Let a map $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ be defined by $f(a) = c$, $f(b) = a$, $f(c) = d$, $f(d) = b$. Clearly f is $(1,2)^*$-δgp continuous but not $(1,2)^*$-gb continuous and also it is not $(1,2)^*$-b continuous because $f^{-1}(\{a, b, d\}) = \{a, b, c\}$ is not $(1,2)^*$-gb closed and also it is not $(1,2)^*$-b closed.

Example3.17. Let $X = Y = \{a, b, c\}$, $\tau_1 = \{\phi, \{a\}, X\}$, $\tau_2 = \{\phi, \{c\}, \{a, c\}, X\}$, $\sigma_1 = \{\phi, \{b\}, \{b, c\}, Y\}$ and $\sigma_2 = \{\phi, \{a, b\}, Y\}$. Let a map $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ be defined by $f(a) = c$, $f(b) = a$, $f(c) = b$. Clearly f is $(1,2)^*$-gb and $(1,2)^*$-b continuous but not $(1,2)^*$-δgp continuous because $f^{-1}(\{c\}) = \{a\}$ is not $(1,2)^*$-δgp closed.

Remark 3.18. If $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ is $(1,2)^*$-δgp continuous and $g:(Y, \sigma_1, \sigma_2) \to (Z, \eta_1, \eta_2)$ is (1, 2)* - δgp continuous, then $g \circ f:(X, \tau_1, \tau_2) \to (Z, \eta_1, \eta_2)$ need not be $(1,2)^*$-δgp continuous. The following example supports our claim.

Example 3.19. Let $X = Y = Z = \{a, b, c\}$, $\tau_1 = \{\phi, \{a\}, X\}$, $\tau_2 = \{\phi, \{c\}, \{a, c\}, X\}$, $\sigma_1 = \{\phi, \{a\}, Y\}$, $\sigma_2 = \{\phi, \{c\}, Y\}$, $\eta_1 = \{\phi, \{a\}, Z\}$ and $\eta_2 = \{\phi, \{b\}, \{a, c\}, Z\}$. Let $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ and $g:(Y, \sigma_1, \sigma_2) \to (Z, \eta_1, \eta_2)$ be the identity maps. Then f and g are $(1,2)^*$-δgp continuous functions, but $g \circ f$ is not $(1,2)^*$-δgp continuous because $(g \circ f)^{-1}(\{a, c\}) = f^{-1}(g^{-1}(\{a, c\}) = f^{-1}(\{a, c\}) = \{a, c\}$ is not $(1,2)^*$-δgp closed.

Proposition 3.20. A map $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ is $(1,2)^*$-δgp continuous if and only if $f^{-1}(U)$ is $(1,2)^*$-δgp open in X for every $\sigma_1\sigma_2$ - open set U in Y .

Proof. Let $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ be $(1,2)^*$-δgp continuous and σ1σ2 -open set U in Y. Then U^c is $\sigma_1\sigma_2$-closed in Y and since f is $(1,2)^*$-δgp continuous, $f^{-1}(U^c)$ is $(1,2)^*$-δgp closed in X . But $f^{-1}(U^c) = [f^{-1}(U)]^c$ and so $f^{-1}(U)$ is $(1,2)^*$-δgp open in X.

Conversely, assume that $f^{-1}(U)$ is is $(1,2)^*$-δgp open in X for every $\sigma_1\sigma_2$-open set U in Y. Let F be a $\sigma_1\sigma_2$-closed set in Y. Then F^c is $\sigma_1\sigma_2$-open in Y and by assumption $f^{-1}(F^c)$ is $(1,2)^*$-δgp open in X . Since $f^{-1}(F^c) = [f^{-1}(F)]^c$, $f^{-1}(F)$ is $(1,2)^*$-δgp closed in X and so f is $(1,2)^*$-δgp continuous.

Definition 3.21. A function $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ is called $(1,2)^*$-δgp irresolute if $f^{-1}(V)$ is $(1,2)^*$-δgp closed in (X, τ_1, τ_2) for each $(1,2)^*$-δgp closed set V in (Y, σ_1, σ_2).

Example 3.22. Let $X = Y = \{a, b, c\}$, $\tau_1 = \{\phi, \{a\}, X\}$, $\tau_2 = \{\phi, \{b\}, \{a, c\}, X\}$, $\sigma_1 = \{\phi, \{a\}, \{a, c\}, Y\}$ and $\sigma_2 = \{\phi, \{c\}, Y\}$. Let a map $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ be defined by $f(a) = c$, $f(b) = a$, $f(c) = b$. Hence f is $(1,2)^*$-δgp irresolute.

Theorem 3.23. If a map $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ called $(1,2)^*$-δgp irresolute then it is $(1,2)^*$-δgp continuous.

Proof. Let $f:(X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ be $(1,2)^*$-δgp irresolute. Let V be $\sigma_1\sigma_2$-closed set in (Y, σ_1, σ_2). Since every $\sigma_1\sigma_2$-closed set is $(1,2)^*$-δgp closed, V is $(1,2)^*$-δgp closed in Y.

Since f is $(1,2)^*$-δgp irresolute, $f^{-1}(V)$ is $(1,2)^*$-δgp closed in X. Hence f is $(1,2)^*$-δgp continuous.

Remark 3.24. The converse of the above theorem is not true in general as shown in the following example.

Example 3.25. Let $X = Y = \{a, b, c\}$, $\tau_1 = \{\phi, \{a\}, X\}$, $\tau_2 = \{\phi, \{c\}, X\}$, $\sigma_1 = \{\phi, \{c\}, Y\}$ and $\sigma_2 = \{\phi, \{a\}, \{a, c\}, Y\}$. Let a map $f : (X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ be the identity map. Then f is $(1,2)^*$-δgp continuous but it is not $(1,2)^*$-δgp irresolute because $f^{-1}(\{a, c\}) = \{a, c\}$ is not $(1,2)^*$-δgp closed in X .

Theorem 3.26. Let $f : (X, \tau_1, \tau_2) \to (Y, \sigma_1, \sigma_2)$ and $g : (Y, \sigma_1, \sigma_2) \to (Z, \eta_1, \eta_2)$ be two functions. Then

(i) $g \circ f : (X, \tau_1, \tau_2) \to (Z, \sigma_1, \sigma_2)$ is $(1,2)^*$-δgp continuous, if g is $(1,2)^*$-continuous and f is $(1,2)^*$-δgp continuous.

(ii) $g \circ f : (X, \tau_1, \tau_2) \to (Z, \sigma_1, \sigma_2)$ is $(1,2)^*$-δgp irresolute, if g is $(1,2)^*$-δgp irresolute and f is $(1,2)^*$-δgp irresolute.

(i) $g \circ f : (X, \tau_1, \tau_2) \to (Z, \sigma_1, \sigma_2)$ is $(1,2)^*$-δgp continuous, if g is $(1,2)^*$-δgp continuous and f is $(1,2)^*$-δgp irresolute.

Proof. (i) Let A be any $\eta_1\eta_2$ closed set in (Z, η_1, η_2). Since g is (1, 2)* -continuous, $g^{-1}(A)$ is closed in (Y, σ_1, σ_2). Also f is $(1,2)^*$-δgp continuous, $f^{-1}(g^{-1}(A)) = (g \circ f)^{-1}(A)$ is $(1,2)^*$-δgp closed in (X, τ_1, τ_2). Hence $g \circ f$ is $(1,2)^*$-δgp continuous function.

(ii) Let A be any $\eta_1\eta_2$ closed set in (Z, η_1, η_2). Then A is $(1,2)^*$-δgp closed in (Z, η_1, η_2). Since g is (1, 2)* -irresolute, $g^{-1}(A)$ is $(1,2)^*$-δgp closedin (Y, σ_1, σ_2). Also f is $(1,2)^*$-δgp irresolute, $f^{-1}(g^{-1}(A)) = (g \circ f)^{-1}(A)$ is $(1,2)^*$-δgp closed in (X, τ_1, τ_2). Hence $g \circ f$ is $(1,2)^*$-δgp irresolute function.

(iii) Let A be any $\eta_1\eta_2$ closed set in (Z, η_1, η_2). Since g is (1, 2)* -continuous, $g^{-1}(A)$ is $(1,2)^*$-δgp closed in (Y, σ_1, σ_2). Also f is $(1,2)^*$-δgp irresolute, $f^{-1}(g^{-1}(A)) = (g \circ f)^{-1}(A)$ is $(1,2)^*$-δgp closed in (X, τ_1, τ_2). Hence $g \circ f$ is $(1,2)^*$-δgp irresolute function.

4. Conclusion

In this paper we define a new class of generalized continuous function called $(1,2)^*$-δgp continuous and investigate their relationships to other generalized continuous functions. We further study a new class of functions namely $(1,2)^*$-δgp irresolute. Also discussed some of their properties.

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