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Nano semi c^* generalized continuous functions in nano topological spaces

A. Pushpalatha[1] and S. Sridevi[2]

Abstract
The aim of this paper is to introduce and study the concept of new class of function called nano semi c^* generalized continuous function. Some of its basic properties are analyzed.

Keywords
Nsc^*g-closed set, Nsc^*g-continuous function.

AMS Subject Classification
54B05,54C05

[1] *Department of Mathematics, Government Arts College, Udumalpet, Tamil Nadu, India.*
[2] *Department of Mathematics, Vidyasagar College of Arts and Science, Udumalpet, Tamil Nadu, India.*
***Corresponding author**: [1] Velu_pushpa@yahoo.co.in; [2] sriyukana22@gmail.com
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Contents

1. Introduction

Continuity of functions is one of the core concept of topology. In general, a continuous function is one, for which small changes in the input result is in small changes in the output. The concept of nano topology was introduced by Lellis Thivagar[2,3], which was defined in terms of approximations and boundary region of a subset of an universe using an equivalence relation on it. He has also defined nano closed sets, nano interior, nano closure and nano continuity. In this paper, we have introduced a new class of function on nano topological spaces called nano semi c^* generalized continuous function and also discuss some of its properties. Throughout this paper $(U,\tau_R(X))$ is a nano topological space with respect to X where $X \subseteq U$, R is an equivalence relation on U, U/R denotes the family of equivalence relation of U by R and $(V,\tau_{R'}(Y))$ is a nano topological space with respect to Y where $Y \subseteq V$, R' is an equivalence relation on V, V/R' denotes the family of equivalence relation of V by R' and $(W,\tau_{R''}(Z))$ is a nano topological space with respect to W where $Z \subseteq W$, R'' is an equivalence relation on W, W/R'' denotes the family of equivalence relation of W by R''.

2. Preliminaries

This section is to recall some definitions and properties which are useful in this study.

Definition 2.1. *[2] Let U be a non-empty finite set of objects called the universe and R be an equivalence relation on U named as indiscernibility relation. Then U is divided into disjoint equivalence classes. Elements belonging to the same equivalence class are said to be indiscernible with one another. The pair (U,R) is said to be the approximation space. Let $X \subseteq U$. Then,*
(i)The lower approximation of X with respect to R is the set of all objects, which can be for certain classified as X with respect to R and is denoted by $L_R(X)$.
$L_R(X) = \bigcup_{x\in U}\{R(x) : R(x) \subseteq X\}$ *where $R(x)$ denotes the equivalence class determined by $x \in U$.*
(ii)The upper approximation of X with respect to R is the set of all objects which can be possibly classified as X with respect to R and is denoted by $U_R(X)$.
$U_R(X) = \bigcup_{x\in U}\{R(x) : R(x) \cap X \neq \phi\}$
(iii)The boundary region of X with respect to R is the set of all objects which can be classified neither as X nor as not-X with respect to R and it is denoted by $B_R(X)$.
$B_R(X) = U_R(X)$ -$L_R(X)$.

Proposition 2.2. *[2]If (U,R) is an approximation space and $X,Y \subseteq U$, then*

1. $L_R(X) \subseteq X \subseteq U_R(X)$
2. $L_R(\phi) = U_R(\phi) = \phi$
3. $L_R(U) = U_R(U) = U$
4. $U_R(X \cup Y) = U_R(X) \cup U_R(Y)$
5. $U_R(X \cap Y) \subseteq U_R(X) \cap U_R(Y)$
6. $L_R(X \cup Y) \supseteq L_R(X) \cup L_R(Y)$
7. $L_R(X \cap Y) = L_R(X) \cap L_R(Y)$
8. $L_R(X) \subseteq L_R(Y)$ and $U_R(X) \subseteq U_R(Y)$ whenever $X \subseteq Y$
9. $U_R(X^c) = [L_R(X)]^c$ and $L_R(X^c) = [U_R(X)]^c$
10. $U_R[U_R(X)] = L_R[U_R(X)] = U_R(X)$
11. $L_R[L_R(X)] = U_R[L_R(X)] = L_R(X)$

Definition 2.3. *[2] Let U be the universe, R be an equivalence relation on U and $\tau_R(X) = \{U, \phi, L_R(X), U_R(X), B_R(X)\}$ where $X \subseteq U$. Then $\tau_R(X)$ satisfies the following axioms*
(i) U and $\phi \in \tau_R(X)$.
(ii) The union of the elements of any sub-collection of $\tau_R(X)$ is in $\tau_R(X)$.
(iii) The intersection of the elements of any finite sub collection of $\tau_R(X)$ is in $\tau_R(X)$.
Then $\tau_R(X)$ is a topology on U called the nano topology on U with respect to X. We call $(U, \tau_R(X))$ as nano topological space. The elements of $\tau_R(X)$ are called as nano-open sets. The complement of the nano-open sets are called nano-closed sets.

Remark 2.4. *[2]If $\tau_R(X)$ is the nano topology on U with respect to X, then the set $B = \{U, L_R(X), B_R(X)\}$ is the basis for $\tau_R(X)$.*

Definition 2.5. *[2] If $(U, \tau_R(X))$ is a nano topological space with respect to X where $X \subseteq U$ and if $A \subseteq U$, then*
(i)The nano interior of A is defined as the union of all nano-open subsets of A is contained in A and is denoted by $Nint(A)$. That is, $Nint(A)$ is the largest nano-open subset of A.
(ii)The nano closure of A is defined as the intersection of all nano-closed sets containing A and is denoted by $Ncl(A)$. That is, $Ncl(A)$ is the smallest nano-closed set containing A.

Definition 2.6. *If $(U, \tau_R(X))$ be a nano topological space and A then A is said to be*
i) nano pre open set [2] if $A \subseteq Nint(Ncl(A))$
ii) nano semi open set [2] if $A \subseteq Ncl(Nint(A))$
iii) nano α-open set [2] if $A \subseteq Nint(Ncl(Nint(A)))$
iv) nano regular open set [2] if $A = Nint(Ncl(A))$
v) nano sg-closed set [1] if $Nscl(A) \subseteq G$, whenever $A \subseteq G$ and G is nano semi open set in $(U, \tau_R(X))$.
vi) nano g^*s -closed set [5] if $Nscl(A) \subseteq G$, whenever $A \subseteq G$ and G is nano g-open set in $(U, \tau_R(X))$.
vii) nano α^*-set [7] if $Nint(A) = Nint(Ncl(Nint(A)))$
viii) nano c^*-set [7] if $A = G \cap F$ where G is Ng-open and F is a $N\alpha^*$ -set in $(U, \tau_R(X))$.
ix) nano sc^*g closed set [7] if $Nscl(A) \subseteq G$, whenever $A \subseteq G$, and G is Nc^*-set in $(U, \tau_R(X))$.

Definition 2.7. *[3]The map $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ from a nano topological space $(U, \tau_R(X))$ to a nano topological space $(V, \tau_{R'}(Y))$ is nano continuous function if $f^{-1}(A)$ is nano closed in U for every nano closed set A in V.*

Definition 2.8. *[6] A function $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ is said to be nano semi continuous if $f^{-1}(B)$ is nano semi-open on U for every nano-open set B in V.*

Definition 2.9. *[6] A function $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ is said to be nano pre continuous if $f^{-1}(B)$ is nano pre-open in U for every nano-open set B in V.*

Definition 2.10. *[8] A subset $M_x \subset U$ is called a nano semi pre-neighbourhood ($N\beta$-nhd) of a point $x \in U$ iff there exists a $A \in N\beta O(U, X)$ such that $x \in A \subset M_x$ and a point x is called $N\beta$-nhd point of the set A.*

3. Nano sc^*g-continuous functions

In this section, we define the function called Nsc^*g-continuous function and study their some of its properties.

Definition 3.1. *Let $(U, \tau_R(X))$ and $(V, \tau_{R'}(Y))$ be nano topological spaces. Then a mapping $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ is called nano semi c^* generalized continuous function (briefly Nsc^*g -continuous) on U if the inverse image of every nano open set in V is nano semi c^* generalized open set in U.*

Example 3.2. *Let $U = \{a, b, c, d\}$ with $U/R = \{\{a\}, \{c\}, \{b, d\}\}$ and $X = \{a, b\}$. Then $\tau_R(X) = \{U, \phi, \{a\}, \{b, d\}, \{a, b, d\}\}$ which are nano open sets.*
1. nano closed set : $\tau_R^c(X) = \{U, \phi, \{c\}, \{a, c\}, \{b, c, d\}\}$
2. nano sc^*g-closed set: $\{U, \phi, \{a\}, \{c\}, \{a, c\}, \{b, d\}, \{b, c, d\}\}$
Let $V = \{x, y, z, w\}$ and $V/R' = \{\{x\}, \{w\}, \{y, z\}\}$ and $Y = \{x, z\}$. Then $\tau_{R'}(Y) = \{V, \phi, \{x\}, \{y, z\}, \{x, y, z\}\}$ which are nano open sets.
1. nano closed set : $\tau_{R'}^c(Y) = \{V, \phi, \{w\}, \{x, w\}, \{y, z, w\}\}$
2. nano sc^*g-closed set: $\{V, \phi, \{x\}, \{w\}, \{x, w\}, \{y, z\}, \{x, y, z\}, \{y, z, w\}\}$ Then define as $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ as
$f(a) = x$, $f(b) = z$, $f(c) = w$, $f(d) = y$
$f^{-1}(x) = a$, $f^{-1}(z) = b$, $f^{-1}(w) = c$, $f^{-1}(y) = d$
Thus the inverse image of every nano open set in V is nano sc^*g-open in U. Hence $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ is nano sc^*g-continuous on U.

Theorem 3.3. *A function $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ is Nsc^*g-continuous if and only if the inverse image of every nano closed in V is Nsc^*g-closed set in U.*

Proof. Let $f : (U, \tau_R(X)) \to (V, \tau_{R'}(Y))$ is Nsc^*g-continuous and B be a nano-closed set in V. (i.e.,) $V - B$ is nano open in

V. Since f is Nsc^*g-continuous, $f^{-1}(V-B)$ is Nsc^*g-open in U. (i.e.,) $f^{-1}(V)-f^{-1}(B)$ is Nsc^*g-open in U. $U-f^{-1}(B)$ is Nsc^*g-open in U. Hence f is Nsc^*g-closed in U, if f is Nsc^*g-continuous on U.

Conversely, let the inverse image of every nano-closed set in V is Nsc^*g-closed set in U. Let G be a nano-open set in V. Then $V-G$ is nano-closed set in V, $f^{-1}(V-B)$ is Nsc^*g-closed set in U. (i.e.,) $f^{-1}(V)-f^{-1}(B)=U-f^{-1}(B)$ is Nsc^*g-closed set in U. Therefore $f^{-1}(B)$ is Nsc^*g-open set in U. Hence f is Nsc^*g-continuous in U. □

Theorem 3.4. *A function $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ is Nsc^*g-continuous if and only if $f(Ncl(A))\subseteq Ncl(f(A))$ for every subset A of U.*

Proof. Let f be a Nsc^*g-continuous function and $A\subseteq U$. Then $f(A)\subseteq V$. $Ncl(f(A))$ is nano-closed set in V. Since f is Nsc^*g-continuous, $f^{-1}(Ncl(f(A)))$ is Nsc^*g-closed set in U. Since $f(A)\subseteq Ncl(f(A))$, $A\subseteq f^{-1}(Ncl(f(A)))$. Thus $f^{-1}(Ncl(f(A)))$ is nano-closed set containing A. But Ncl is the smallest nano-closed set containing A and every nano-closed set is Nsc^*g-closed set. Therefore $Ncl(A)\subseteq f^{-1}(Ncl(f(A)))$. That is, $f(Ncl(f(A)))\subseteq Ncl(f(A))$.

Conversely, let $f(Ncl(f(A)))\subseteq Ncl(f(A))$ for every subset A of U. Let F be a nano-closed in V. Since $f^{-1}(F)\subseteq U$, $f(Ncl(f^{-1}(F)))\subseteq Ncl(f(f^{-1}(F)))=Ncl(F)$. That is $Ncl(f^{-1}(F))\subseteq f^{-1}(Ncl(F))=f^{-1}(F)$, since F is nano-closed. Thus $Ncl(f^{-1}(F))\subseteq f^{-1}(F)$. Therefore $f^{-1}(F)$ is nano-closed in U for every closed set F in V. Since every nano-closed set is Nsc^*g-closed set, $f^{-1}(F)$ is Nsc^*g-closed in U. Hence f is Nsc^*g-continuous function. □

Remark 3.5. *If $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ is Nsc^*g -continuous then $f(Ncl(A))$ is not necessarily equal to $Ncl(f(A))$ where $A\subseteq U$.*

Example 3.6. *Let $U=\{a,b,c,d\}$ with $U/R=\{\{a\},\{b,d\},\{c\}\}$. Let $X=\{a,c,d\}$. Then $\tau_R(X)=\{\phi,U,\{a,c\},\{b,d\}\}$ and $\tau_R^c(X)=\{\{\phi,U,\{a,c\},\{b,d\}\}$. Let $V=\{x,y,z,w\}$ with $V/R'=\{\{x,z\},\{y\},\{w\}\}$. Let $Y=\{x,y\}$. Then $\tau^c_{R'}(Y)=\{\phi,V,\{y\},\{x,y,z\}\{x,z\}\}$ and $\tau^c_R(Y)=\{\phi,V,\{w\},\{y,w\}\{x,z,w\}\}$.*
Let $f:(U,\tau_R(X))\to(V,\tau^c_{R'}(Y))$ be a function defined by $f(a)=y$, $f(b)=x$, $f(c)=y$, $f(d)=x$.
Then $f^{-1}(v)=U$, $f^{-1}(\phi)=\phi$, $f^{-1}(y)=\{a,c\}$, $f^{-1}(\{x,y,z\})=U$, $f^{-1}(\{x,z\})=\{b,d\}$.
That is the inverse image of every nano-open set in V is Nsc^*g-open set in U. Therefore f is Nsc^*g-continuous on U. Let $A=\{a,c\}$. $f(Ncl(A))=f(Ncl(\{a,c\})=f(\{a,c\})=y$. But $Ncl(f(A))=Ncl(f(\{a,c\}))=Ncl(\{y\})=\{y,w\}$. Thus $f(Ncl(A)\neq Ncl(f(A))$, where f is Nsc^*g-continuous function.

Remark 3.7. *Composition of two Nsc^*g-continuous functions need not be a Nsc^*g-continuous function.*

Example 3.8. *Let $U=\{a,b,c,d\}$ with $U/R=\{\{a\},\{c\},\{b,d\}\}$ and let $X=\{a,b\}$. Then $\tau_R(X)=\{\phi,U,\{a\},\{a,b,d\}\{b,d\}\}$ is a nano topology on U. Let $V=\{a,b,c,d\}$ with $V/R'=\{\{a\},\{b,c\},\{d\}\}$ and $Y=\{b,c\}$ then $\tau_{R'}(Y)=\{\phi,V,\{a\},\{a,b,c\}\{b,c\}\}$ is a nano topology on V. Let $W=\{a,b,c,d\}$ with $W/R''=\{\{a,b\},\{c\},\{d\}\}$ and $Z=\{a,c\}$ then $\tau_{R''}(W)=\{\phi,W,\{d\},\{c,d\},\{a,b,d\}\}$. Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ defined by $f(a)=a$, $f(b)=c$, $f(c)=d$, $f(d)=b$ and $g:(V,\tau_{R'}(X))\to(W,\tau_{R''}(Y))$ is identity function defined by $g(a)=a$, $g(b)=b$, $g(c)=c$, $g(d)=d$. Functions f and g are Nsc^*g-continuous function but their composition $g\circ f=f:(U,\tau_R(X))\to(W,\tau_{R''}(Z))$ is not Nsc^*g-continuous function, since the inverse image of $\{c\}$ and $\{b,d\}$ are not a Nsc^*g-closed set.*

Theorem 3.9. *If $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ is nano continuous then it is Nsc^*g-continuous in $(U,\tau_R(X))$ but not conversely.*

Proof. Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a nano-continuous function. Let A be any nano closed set in $(V,\tau_{R'}(Y))$. Then $f^{-1}(A)$ is nano closed set in $(U,\tau_R(X))$. Since every nano closed set is Nsc^*g-closed set, $f^{-1}(A)$ is Nsc^*g-closed in $(U,\tau_R(X))$. Therefore f is Nsc^*g -continuous function. □

Example 3.10. *Let $U=V=\{a,b,c,d\}$ with $U/R=V/R'=\{\{a\},\{c\},\{b,d\}\}$ and let $X=Y=\{a,b\}$. Then $\tau_R(X)=\tau_R'(Y)=\{\phi,U,\{a\},\{a,b,d\}\{b,d\}\}$ is a nano topology and $\tau^c_R(X)=\tau'_Rc(Y)=\{\phi,U,\{c\},\{b,c,d\},\{a,c\}\}$ are nano closed sets. Nsc^*g -closed set : $\{\phi,U,\{a\},\{c\},\{a,c\},\{b,d\},\{b,c,d\}\}$. Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be an identity map. Then f is a Nsc^*g-continuous function. But not nano continuous, since $f^{-1}(\{b,d\})=\{b,d\}$ and $f^{-1}(\{a\})=\{a\}$ are not nano closed sets in $(U,\tau_R(X))$.*

Theorem 3.11. *If $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ is nano α-continuous then it is Nsc^*g-continuous but not converse.*

Proof. Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a nano α-continuous function. Let A be any nano closed set in $(V,\tau_{R'}(Y))$. Then $f^{-1}(A)$ is nano α -closed set in $(U,\tau_R(X))$. Since every nano α-closed set is Nsc^*g-closed set, $f^{-1}(A)$ is Nsc^*g-closed in $(U,\tau_R(X))$. Therefore f is Nsc^*g-continuous function. □

Example 3.12. *Let $U=V=\{a,b,c,d\}$ with $U/R=V/R'=\{\{a\},\{c\},\{b,d\}\}$ and let $X=Y=\{a,b\}$. Then $\tau_R(X)=\tau_R'(Y)=\{\phi,U,\{a\},\{a,b,d\}\{b,d\}\}$ is a nano topology and $\tau^c_R(X)=\tau'_Rc(Y)=\{\phi,U,\{c\},\{b,c,d\},\{a,c\}\}$ and Nsc^*g -closed set : $\{\phi,U,\{a\},\{c\},\{a,c\},\{b,d\},\{b,c,d\}\}$.*
nano α-closed set : $\{\phi,U,\{c\},\{a,c\},\{b,c,d\}\}$
Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a identity map. Then f is Nsc^*g-continuous function, but not $N\alpha$-continuous function. Since the inverse image of $\{a\}$, $\{b,d\}$ are not $N\alpha$-closed sets in $(U,\tau_R(X))$.

Theorem 3.13. *If $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ is nano regular-continuous then it is Nsc^*g-continuous but not conversely.*

Proof. Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a nano regular-continuous function. Let A be any nano closed set in $(V,\tau_{R'}(Y))$. Then $f^{-1}(A)$ is nano regular-closed set in $(U,\tau_R(X))$. Since every nano regular-closed set is Nsc^*g-closed set, $f^{-1}(A)$ is a Nsc^*g-closed in $(U,\tau_R(X))$. Therefore f is a Nsc^*g -continuous function. □

Example 3.14. *Let $U=V=\{a,b,c,d\}$ with $U/R=V/R'=\{\{a\},\{c\},\{b,d\}\}$ and let $X=Y=\{a,b\}$. Then $\tau_R(X)=\tau^c_{R'}(Y)=\{\phi,U,\{a\},\{a,b,d\}\{b,d\}\}$ is a nano topology and $\tau^c_R(X)=\tau^c_{R'}(Y)=\{\phi,U,\{c\},\{b,c,d\},\{a,c\}\}$ and Nsc^*g -closed set : $\{\phi,U,\{a\},\{c\},\{a,c\},\{b,d\},\{b,c,d\}\}$.*
nano regular-closed set : $\{\phi,U,\{a,c\},\{b,c,d\}\}$
Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a identity map. Then f is Nsc^*g-continuous function, but not Nr-continuous function. Since the inverse image of $\{a\}$, $\{c\}$, $\{b,d\}$ are not nano regular-closed sets in $(U,\tau_R(X))$.

Theorem 3.15. *If $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ is Nsc^*g-continuous then it is Nsc^*g-continuous. Conversely need not be true.*

Proof. Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a Nsc^*g-continuous function. Let A be any nano closed set in $(V,\tau_{R'}(Y))$. Then $f^{-1}(A)$ is Nsc^*g-closed set in $(U,\tau_R(X))$. Since every Nsc^*g-closed set is Nsg-closed set in $(U,\tau_R(X))$, $f^{-1}(A)$ is a Nsg-closed in $(U,\tau_R(X))$. Therefore f is a Nsg -continuous function. □

Example 3.16. *Let $U=V=\{a,b,c,d\}$ with $U/R=V/R'=\{\{a\},\{c\},\{b,d\}\}$ and let $X=Y=\{a,b\}$. Then $\tau_R(X)=\tau_{R'}(Y)=\{\phi,U,\{a\},\{a,b,d\}\{b,d\}\}$ is a nano topology and $\tau^c_R(X)=\tau^c_{R'}(Y)=\{\phi,U,\{c\},\{b,c,d\},\{a,c\}\}$ and Nsc^*g-closed set : $\{\phi,U,\{a\},\{c\},\{a,c\},\{b,d\},\{b,c,d\}\}$.*
nano sg-closed set : $\{\phi,U,\{a\},\{b\},\{c\},\{d\},\{a,c\},\{b,c\},\{b,d\},\{c,d\},\{a,b,c\},\{a,c,d\},\{b,c,d\}\}$ Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a identity map. Then f is Nsg-continuous function, but not Nsc^*g -continuous function. Since the inverse image of $\{d\}$, $\{b\}$, $\{b,c\}$, $\{c,d\}$, $\{a,b,c\}$, $\{a,c,d\}$ are not Nsc^*g-closed sets in $(U,\tau_R(X))$.

Theorem 3.17. *If $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ is Nsc^*g-continuous then it is Nsg-continuous function.*

Proof. Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a Nsc^*g-continuous function. Let A be any nano closed set in $(V,\tau_{R'}(Y))$. Then $f^{-1}(A)$ is Nsc^*g-closed set in $(U,\tau_R(X))$. Since every Nsc^*g-closed set is Ng^*s-closed set in $(U,\tau_R(X))$, $f^{-1}(A)$ is a Ng^*s-closed in $(U,\tau_R(X))$. Therefore f is a Ng^*s-continuous function. The converse of the above theorem need not be true as seen from the following example. □

Example 3.18. *Let $U=V=\{a,b,c,d\}$ with $U/R=V/R'=\{\{a\},\{c\},\{b,d\}\}$ and let $X=Y=\{a,b\}$. Then $\tau_R(X)=\tau_{R'}(Y)=\{\phi,U,\{a\},\{a,b,d\}\{b,d\}\}$ is a nano topology and $\tau^c_R(X)=\tau^c_{R'}(Y)=\{\phi,U,\{c\},\{b,c,d\},\{a,c\}\}$ and Nsc^*g -closed set : $\{\phi,U,\{a\},\{c\},\{a,c\},\{b,d\},\{b,c,d\}\}$.*
Ng^*s-closed set : $\{\phi,U,\{a\},\{c\},\{a,c\},\{b,c\},\{b,d\},\{c,d\},\{a,b,c\},\{a,c,d\},\{b,c,d\}\}$
Let $f:(U,\tau_R(X))\to(V,\tau_{R'}(Y))$ be a identity map. Then f is Ng^*s-continuous function, but not Nsc^*g -continuous function. Since the inverse image of $\{b,c\}$, $\{c,d\}$, $\{a,b,c\}$ are not Nsc^*g-closed sets in $(U,\tau_R(X))$.

References

[1] K.Bhuvaneswari and K.Mythili Gnanapriya, On nano Generalized Continuous function in nano Topological spaces, *International journal of Mathematical Archive*, 6(6)(2015), 182–189.

[2] M.Lellis Thivagar, Carmel Richard, On nano Forms of Weakly open sets, *International Journal of Mathematics and Statistics Invention*, 1(2013), 31–37.

[3] M.Lellis Thivagar, Carmel Richard, On nano Continuity, *Math. Theory Model*, 7(2013), 32–37.

[4] D.A Mary, I.Arokiarani, On characterizations of nano rgb-closed sets in nano topological spaces, *Int. J. Mod. Eng. Res.*, 5(1)(2015), 68–76.

[5] V.Rajendran, B.Anand, S. Sharmilabanu, On nano generalized Star semi closed sets in nano topological space, *International Journal of Applied Research*, 1(9)(2015), 142–144.

[6] P.Sathishmohan, V.Rajendran, A.Devika and P.Vani, On nano semi -continuity and nano pre-continuity, *International Journal of Applied Research*, 3(2)(2017), 76–79.

[7] S.Sridevi, A.Pushpalatha, On nano Semi c* generalized closed sets in nano topological spaces, *Malaya Journal of Matematik* (Submitted).

[8] Sathishmohan.P, Rajendran.V, Vignesh Kumar.C and Dhanasekaran.P.K, On nano semi pre neighbourhoods on nano topological spaces, *Malaya Journal of Matematik*, 6(1)(2018), 294–298.

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