*i*Journals: International Journal of Social Relevance & Concern (IJSRC)
ISSN-2347-9698
Volume 9 Issue 1 January 2021

$\propto_A^* g$ CONTINUOUS FUNCTION IN TOPOLOGICAL SPACES

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Abstract

The purpose of this paper is to introduce $\propto_A^*$g - continuous function and $\propto_A^*$g - irresolute function in topological spaces and discuss its properties. Additionally we relate these functions with some other functions with some other functions in topological spaces.

Mathematics Subject Classification: 54A05

Keywords and phrases: $\propto_A^*$ g - continuous functions, $\propto_A^*$g - irresolute functions, $\propto_A^*$g- open maps and$\propto_A^*$g - closed maps.

1. Introduction

In 1980 S. N. Maheswari and S.S. Thakur[10] defined α – continuous functions and obtained several properties of α -

irresolute functions. In 1983 A.S. Mashour er al{9} discussed about

α - continuous functions and α - open mappings. In 1984, Takashi Noiri, Yatsushiro further investigated the relationship between α - continuous functions and several known functions in topological spaces. In 1985, L. Reily and M.K. Vanmanamurthy[13] extended his work on α continuity., S.PiousMissier and P.Anbarasi Rodrigo defined α * - continuous functions and

α * - irresolute functions.

In this paper, we define $\propto_A^*$g–continuous functions and $\propto_A^*$g–irresolute functions.

2. Preliminaries:

Throughout this paper(X, τ),(Y, σ) and (Z, η) represent non – empty topological spaces on which no separation axioms are assumed unless otherwise mentioned. For a subset A of a space (X, τ),cl(A) and int(A) denote the closure and the interior of A respectively. The power set of X is denoted by P(X).

Definition 2.1 : A function f: (X, τ)⟶(Y, σ) is called a **semi - continuous** [5] if f^{-1}(O)is a **semi - open** set [5] of (X, τ) for every open set O of (Y,σ).

Definition 2.2 : A function f: (X, τ)⟶(Y, σ) is called a **α - continuous** [9] if f^{-1}(O)is a **α- open** set [11] of (X, τ) for every open set O of (Y,σ).

Definition 2.3 : A function f: (X, τ)⟶(Y, σ) is called a **g - continuous** [1] if f^{-1}(O)is a **g - open** set [6] of (X, τ) for every open set O of (Y,σ).

Definition 2.4 : A function f: (X, τ)⟶(Y, σ) is called a **αg - continuous** [4] if f^{-1}(O)is a**αg- open** set [8] of (X, τ) for every open set O of (Y,σ).

Definition 2.5 : A function f: (X, τ)⟶(Y, σ) is called a g**α - continuous** [7] if f^{-1}(O)is a **gα - open** set [7] of (X, τ) for every open set O of (Y,σ).

Definition 2.6 : A function f: (X, τ)⟶(Y, σ) is called a **α - irresolute**[10] if f^{-1}(O)is a **α- open** set of (X, τ) for every open set O of (Y,σ).

Definition 2.7 : A function f: (X, τ)⟶(Y, σ) is called a **semi - irresolute** if f^{-1}(O)is a**semi- open**set of (X, τ) for every open set O of (Y,σ).

Definition 2.8 : A function f: (X, τ)⟶(Y, σ) is called a **g- irresolute**[1] if f^{-1}(O)is a **g- open**set of (X, τ) for every open set O of (Y,σ).

Theorem 2.5 [12] :

(i). Every closed set is $\propto_A^*$g closed set.

(ii) Every α- closed set $\propto_A^*$g – closed set.

(iii) Every g - closed set is $\propto_A^*$g – closed set.

3. $\propto_A^*$g Continuous Function

We introduce the following definition.

Definition 3.1 : A function f: (X, τ)⟶(Y, σ) is called a $\propto_A^*$g - continuous function if f^{-1}(O) is $\propto_A^*$g- closed set of (X, τ) for every closed set O of (Y,σ).

Example 3.2 :Let X = {a, b, c}, τ = {ϕ, {a},{ab},{ac}, X} , $\propto_A^*$ g (X, τ) = {ϕ,{b},{c},{bc},X} and Y={a,b,c}, σ = {ϕ, {a},{ab},Y} and σ^c ={ϕ,{c},{bc},Y}, $\propto_A^*$ g(Y,σ) ={ϕ,{b},{c},{a},{bc},Y}.

Let f: (X, τ) ⟶(Y, σ) be defined by f(a) = a, f(b)= b, f(c) = c. Clearly, f^{-1}({c}) = {c} is closed set of (X, τ). However, f is $\propto_A^*$ g - continuous.

Theorem 3.3: Every continuous function is $\propto_A^*$ g-continuous.

Proof: Let f: (X, τ)⟶ (Y, σ) be a continuous function. Let O be a closed set of(Y, σ). Since f is a continuous function. f^{-1}(O) is closed in (X, τ) .Since every closed set is α *- closed, f^{-1}(O) is $\propto_A^*$ g-closed in (X, τ) . Hence f is $\propto_A^*$ g - continuous.

Remark 3.4: The following example supports that the converse of the above theorem is not true in general.

Example 3.5: Let X = {a, b, c}, τ = {ϕ, {a}, X} ,τ^c={ϕ,{bc},Y} andY={a,b} and σ = {ϕ, {a},Y} and $\propto_A^*$ g (Y, σ) = {ϕ, {b},Y} Let *f:* (X, τ) ⟶(Y, σ) be defined by f (a) =b,f(b)=a=f(c). Clearly, f is not a continuous since {a} is a closed in $\propto_A^*$ gbut f^{-1}({b}) = {a} is not continuousfunction of (X, τ). However, f is $\propto_A^*$g - continuous.

Theorem 3.6: Every α - continuous function is α *- continuous.

Proof: Let f: (X, τ)⟶ (Y, σ) be a α - continuous function. Let O be a closed set of (Y, σ). Since f is a α - continuous function. f^{-1}(O) is α - closed in (X, τ) . Since every α - closed set is α *-closed, f^{-1}(O) is $\propto_A^*$ g-closed in (X, τ) . Hence f is$\propto_A^*$ g - continuous.

Remark 3.7: The converse of the above theorem need not be true.

Example 3.8: Let X = {a, b, c}, τ = {ϕ, {a}, X} ,τ^c={ϕ,{bc},Y}, αc (X, τ) ={ϕ, {b},{c},{bc}, X} andY={a,b } and σ = {ϕ, {a},Y} and $\propto_A^*$ g (Y, σ)= {ϕ, {b},Y}.Let *f:* (X, τ) ⟶(Y, σ) be defined by f

(a) =b,f(b)=a=f(c). Clearly, f is $\propto_A^*$ g- continuous. But f^{-1}({b}) = {a} is not α -continous. Therefore f is not α - continuous since {a} is a closed in $\propto_A^*$ g.

Theorem 3.9 : Every $\propto_A^*$ g continuous function is gα - continuous

Proof: Let f: (X, τ)⟶ (Y, σ) be a $\propto_A^*$ g - continuous function. Let O be a closed set of (Y, σ). Since f is a $\propto_A^*$ g - continuous function. f^{-1}(O) is $\propto_A^*$ g- closed in (X, τ) . Since every $\propto_A^*$ g - closed set is α *-closed, f^{-1}(O) is $\propto_A^*$ g - closed in (X, τ) . Hence f is gα - continuous.

Remark 3.10: The converse of the above theorem need not be true.

Example3.11: Let X={a,b,c,d}, τ={ϕ,{a},{b},{a,b},{abc},X},τ^c={ϕ,{d},{cd},{acd},{bcd},{Y}.

$\propto_A^*$ g (X, τ) ={ϕ,{c},{d},{ad},{bd},{acd},{bcd},X}and gα={ϕ,{c},{d},{ac},{ad},{bc},{bd},{cd},{acd},{bcd}}and Y={a,b,c,d}

σ={ϕ,{a},{a,b},Y}σ^c={ϕ,{a},{bcd},Y} and $\propto_A^*$ g (Y, σ)={ϕ,{a},{b},{c},{d},{ab},{ac},{ad},{bc},{bd},{cd},{abc},{abd},{acd},{bcd},Y}. Let f: (X, τ) ⟶(Y, σ) be defined by f(a) = c, f(b) = a=f(c) f(d)=b. clearly, f is gα- continuous function but not $\propto_A^*$ g continuous.

f^{-1}({bcd}) = {ad}, Clearly f is gα continuous function but not in$\propto_A^*$ g – continuous. Since, f^{-1}({a}) = {bc} is not in $\propto_A^*$ g- closed. Therefore f is gα-continuous.

Theorem 3.12 : Every αg continuous function is $\propto_A^*$ g-continuous

Proof: Let f: (X, τ)⟶ (Y, σ) be a αg - continuous function. Let O be a closed set of (Y, σ). Since f is a α g - continuous function. f^{-1}(O) is α g closed in (X, τ) ,

f^{-1}(O) is $\propto_A^*$ g -closed in (X, τ) . Hence f is $\propto_A^*$ g-continuous.

Remark 3.13: The converse of the above theorem need not be true.

Example3.14: LetX={a,b,c},τ={ϕ,{ab},X},τ^c={ϕ,{c},Y}.

$\propto_A^*$ g ={ϕ,{a},{b},{c},{bc},{ac}}and

αgc={ϕ,{c},,{ac},{bc}}and Y={a,b,c}

σ={ϕ,{a},,Y}σ^c ={ϕ,{bc},Y} and

$\propto_A^*$ g={ϕ,{b},{c},{bc}}and αgc={ϕ,{b},{c},,{ab},{ac},{bc}}Let f: (X, τ) ⟶(Y, σ) be defined by f(a) = b, f(b) = b, f(c)=a, since, f^{-1}({bc}) = a is not in $\propto_A^*$ g- closed. clearly, f is $\propto_A^*$ g continuous function but not αg continuous. Therefore f is$\propto_A^*$ g -continuous.

Definition 3.15: A topological space (X, τ) is said to be$\propto_A^*$ g - $T_{1/2}$space, if every$\propto_A^*$ g - closed set of Xis closed in X.

Remark 3.16: In $\propto_A^*$ g - $T_{1/2}$space, the concept of continuous and $\propto_A^*$ g -continuous coincides.

Remark 3.17: The concept of semi*- continuity and $\propto_A^*$ gare independent as shown in the following example.

Example 3.18: Let X = Y= {a, b, c,d}, τ = { ϕ , {a} , {b} ,{c}, {ab},{ac},{bc},{abc} , X } ,$\propto_A^*$ g={ ϕ , {d} , {ad} ,{bd}, {cd},{abd},{acd},{bcd} , X}, S^*c ={ ϕ , {a} , {b} ,{c}, {d},{ab},{ac},{ad},{bc},{bd},{cd},{abd},{acd},{bcd}X}σ^c={Φ,{d},{acd},{bcd},X}S^*c ={ ϕ , {c} , {bc} {cd},{bcd} , X} σ = {ϕ , {a} , {b} , {abc} , Y } $\propto_A^*$ g={ ϕ , {b} , {c} ,{d}, {bc},{ad},{cd},{abd},{acd},{bcd} , X}. Let f: (X, τ) ⟶(Y, σ) be a map defined by f(a) = a, f(b) =b, f(c) = c,f(b)=b. clearly, f is semi*- continuous since {a} is open in (Y, σ) but f^{-1}({d}) = {a} is not $\propto_A^*$ g -open in

(X, τ).However f is $semi^*$continuous.

Example 3.19: Let X = Y= {a, b, c,d}, τ = { ϕ , {a} , {b} ,{c}, {d}, X } ,$\propto_A^*$ g={ ϕ , {a}{b},{c}{d} , {ab},{ac}{ad},{bc},{bd}, {cd},{abd},{acd},{bcd} , X},S^*c ={ ϕ , {a} , {b} ,{c}, {d},{ab},{ac},{ad},{bc},{bd},{cd},{abc},{abd},{ acd},{bcd}X}σ^c={Φ,{cd},X} S^*c ={ ϕ , {cd}, X} σ = {ϕ , {ab} , Y }$\propto_A^*$ g={ ϕ , {b} , {c} ,{d}, {bc},{ad},{cd},{abd},{acd},{bcd} , X}.

Let f: (X, τ) ⟶(Y, σ) be a map defined by f(a) = a, f(b) = b,f(c)=c f(d)=d. Clearly, f is not semi - continuous since {ab} is open in (Y, σ) but f^{-1}({cd}) = {cd} is in $\propto_A^*$ g but not in $semi^*$continuous in (X, τ).However f is$\propto_A^*$ g - continuous.

Remark 3.20: The concept of $\propto_A^*$ g –continuous and semi- continousare independent.

Example 3.20: Let X = Y = { a , b , c }, τ ={ ϕ , {a}, X} and σ ={ ϕ , {a} , {ab} , {ac}, Y

Let f: (X, τ) ⟶(Y, σ) be a map defined by f (a) = b, f(b) = a = b, f(c) = c . Clearly, f is α g-continuous , because f^{-1} ({b}) = {a}is $\propto_A^*$ g –closed but not semi closed.

Example 3.21: Let X = Y = { a , b , c , d }, τ = { ϕ , {a},{b},{ab},{abc} , X } and σ = { ϕ,{a,b} , Y } sc= { ϕ , {a} , {b},{c},{d},{ac},{ad},{bc},{b,d}, {acd},{bcd} , X } .

Let f: (X, τ) ⟶(Y, σ) be a map defined by f (a) =d, f(c)=c, f (d) = a, f(a) = d, f(b) =b . Clearly, f is α *- continuous but f is not α g - continuous because f^{-1} ({cd}) = {ac} is semi closed but not in$\propto_A^*$ g-closed.

Theorem 3.22: Let f: (X, τ) ⟶(Y, σ) be a function. Then the following are equivalent:

1. f is $\propto_A^*$ g - continuous
2. The inverse image of closed set in Y is $\propto_A^*$ g-closed in X.
3. $\propto_A^*$ g cl (f^{-1}(A)) ⊆ f^{-1} (cl(A)) for every set A in Y .
4. f ($\propto_A^*$ g cl (A)) ⊆ cl(f(A)) for every set A in X
5. f^{-1}(int (G)) ⊆$\propto_A^*$ g int(f^{-1}(G)) for every set G in Y.

Proof:

(1) ⇒(2):

Let f: (X, τ) ⟶(Y, σ) be $\propto_A^*$g - continuous. Let O be a closed set in Y. Then Y\O is open in Y. Since f is $\propto_A^*$g - continuous, f^{-1} (Y\O) = X\ f^{-1} (O) is $\propto_A^*$ g open in X. It follows that f^{-1} (O) is $\propto_A^*$ g -closed in X.

(2) ⇒(3):

Let A be any subset of Y. Then cl(A) is closed in Y. Therefore, by (2) f^{-1} (cl(A))is$\propto_A^*$ g - closed in X. It implies f^{-1} (cl(A))= α *cl(f^{-1}(cl (A)) ⊇$\propto_A^*$ g cl (f^{-1}(A))

(3) ⇒(4):

Let A be any open subset of X. By (3) f^{-1} (cl(A)) ⊇$\propto_A^*$ g cl(f^{-1}(A)) ⊇$\propto_A^*$ g cl(A)

Hence, f($\propto_A^*$ g cl (A)) ⊆ cl(f(A))

(4) ⇒(5):

Let f ($\propto_A^*$ g cl (A)) ⊆ cl(f(A)) for every set A in X. Then,

$\propto_A^*$ g cl (A) ⊆ f^{-1} (cl(f(A))) which implies that X\ $\propto_A^*$ g cl (A) ⊇ X\ f^{-1} (cl(f(A))) and so $\propto_A^*$ g int (X\A) ⊇f^{-1} (int(Y\f(A))). Then, f^{-1}(int (G)) ⊆$\propto_A^*$ g int(f^{-1}(G))

for every set G= Y \ f(A) in Y .

(5) ⇒(1):

Let G be a open set in Y. Therefore, f^{-1} (int(G)) ⊆ $\propto_A^*$ g int (f^{-1}(G)) ,

hence f^{-1}(G) ⊆ α *int (f^{-1}(G)) .We know that $\propto_A^*$ g int (f^{-1}(G)) ⊆ f^{-1}(G).

Then $\propto_A^*$ g int (f^{-1}(G)) = f^{-1}(G). Therefore, f^{-1}(G) is ∝- open in X .Thus f is$\propto_A^*$ g – continuous

Theorem 3.23: If a map f: (X, τ) ⟶(Y, σ) is $\propto_A^*$ g - continuous and

$g : (Y, \sigma) \to (Z, \eta)$ is continuous, then $(g \circ f)$ is $\propto^*_A$ g - continuous.

Proof: Let O be an open set in Z. Since g is continuous, $g^{-1}(O)$ is open in Y and since f is $\propto^*_A$ continuous then, $(g \circ f)^{-1}(O) = f^{-1}(g^{-1}(O))$ is $\propto^*_A$- open in X. Hence, $(g \circ f)$ is $\propto^*_A$ g - continuous.

Remark 3.24: Composition of two $\propto^*_A$ g - continuous maps need not be $\propto^*_A$ g - continuous maps as it can be seen from the following example.

Example 3.25: Let X = Y = Z = { a , b , c }. Let τ = { ϕ , {a} , {b} ,{a,b} , X } , σ= { ϕ , {ab} ,Y} and η = {ϕ , {a} , {ab}{ac} , Z }. Define $f: (X, \tau) \to (Y, \sigma)$ by f(a) = b,f(b) = c, f(c) = b. Here f^{-1}({ c})=b. Clearly, f is $\propto^*_A$ g continuous. Define $g : (Y, \sigma) \to (Z, \eta)$ by g(a) = b,g(c) = c , g(a) = a. Here g^{-1}({ b})=b, g^{-1}({c})=c,g^{-1}({ bc})=bc. Clearly, g is $\propto^*_A$ g continuous. But $(g \circ f): (X, \tau) \to (Z, \eta)$ is not α^* - continuous, since {a} is closed set in (Z , η) but

$(g \circ f)$ ({b}) = $f^{-1}(g^{-1}\{b\}) = f^{-1}(\{b\})$ = {a} is not $\propto^*_A$ g closed in (X, τ).

4. $\propto^*_A$ g - IRRESOLUTE MAPPINGS

Definition 4.1: A function $f: (X, \tau) \to (Y, \sigma)$ is said to be $\propto^*_A$ g- **Irresolute** iff $f^{-1}(O)$ is a α^*-closed in (X, τ) for every $\propto^*_A$ g –closed set O in (Y, σ).

Theorem 4.2: A map $f: (X, \tau) \to (Y, \sigma)$ is $\propto^*_A$ g - irresolute if and only if the inverse image of every $\propto^*_A$- closed set in Y is $\propto^*_A$ g - closed in X.

Proof: Assume that f is $\propto^*_A$- irresolute map. Let A be any $\propto^*_A$- closed set in Y. Then Y\A is $\propto^*_A$- open in Y. Since, f is $\propto^*_A$- irresolute, f^{-1}(Y\A) is $\propto^*_A$- open in X. But f^{-1}(Y\A) = X\ f^{-1}(A) and so f^{-1}(A) is $\propto^*_A$- closed set in X. Hence the inverse image of every $\propto^*_A$g - closed set in Y is $\propto^*_A$ g - closed in X. Conversely, assume that the inverse image of every $\propto^*_A$g - closed set in Y is $\propto^*_A$ g - closed in X. Let A be any $\propto^*_A$g -closed in Y. Then Y\A is $\propto^*_A$g - closed set in Y. By assumption, f^{-1}(Y\A) is $\propto^*_A$ g - closed set in X. But f^{-1}(Y\A) = X\ f^{-1}(A) and so f^{-1}(A) is $\propto^*_A$ g closed set in X. Therefore, f is $\propto^*_A$g - irresolute.

Theorem 4.3: Every $\propto^*_A$g - irresolute map is $\propto^*_A$ g -continuous.

Proof: Let $f: (X, \tau) \to (Y, \sigma)$ be a $\propto^*_A$ g - irresolute map. Let us consider, O to be anclosed set in Y. Then O is $\propto^*_A$g -closed in Y. Since f is $\propto^*_A$g - irresolute map, f^{-1}(O) is $\propto^*_A$ g - closed in X. Therefore, f is $\propto^*_A$g - continuous.

Remark 4.4: The converse of the above theorem need not be true.

Example 4.5: Let X = Y = { a , b , c } , τ = { ϕ , {a} , {ab} , X } and σ ={ ϕ , {a} , {ab}, Y }. In this space, $\propto^*_A$ g (X, τ) = { ϕ , {b} , {c}, {bc} , Y } P(X) and $\propto^*_A$ g (Y, σ) = { ϕ , {b} , {c}, {bc},{ac} , Y } Let $f: (X, \tau) \to (Y, \sigma)$ be a map defined by f (a) = a, f(b) = d, f(c) = c, clearly, f is $\propto^*_A$ g continuous. f^{-1} ({b}) = {b,d} is $\propto^*_A$ g - continuous but not in Y .

Theorem 4.6: Let $f: (X, \tau) \to (Y, \sigma)$ be a $\propto^*_A$ g - continuous map from X into Y and Y is $\propto^*_A$ g -$T_{1/2}$ space. Then f is $\propto^*_A$g - irresolute.

Proof: Let A be a $\propto^*_A$ g - open set in Y. Since Y is $\propto^*_A$g -$T_{1/2}$, A is an open set in Y. Since f is $\propto^*_A$g - continuous implies f^{-1}(A) is $\propto^*_A$ g - open in X. Hence f is a $\propto^*_A$g -irresolute function.

Remark 4.7: The $\propto^*_A$ g- irresolute and semi-irresolute maps are independent of each other. Let us prove the remark by the following examples.

Example 4.8: Let X = Y = { a , b , c } , τ = { ϕ , {a} , {ab} , X } and σ ={ ϕ , {a} , {ab}, Y }. In this space, $\propto^*_A$ g (X, τ) = { ϕ , {b} , {c}, {bc} , Y } and $\propto^*_A$ g (Y, σ) = { ϕ , {b} , {c}, {bc},{ac} , Y } Let $f: (X, \tau) \to (Y, \sigma)$ be a map defined by f (a) =

a, f(b) = d, f(c) = c, clearly, f is $\propto^*_A$ g continuous.f^{-1} ({b}) = {b,d} is not semi- open in (X, τ).

Example 4.9: Let X = Y= { a , b , c , d } , τ = { ϕ , {a} , {b} , {c} , {a,b} , {a,c}, {b,c} , {a,b,c} , X } and σ = { ϕ , {a} ,{a,b} ,Y}. In this space$\propto^*_A g$={ ϕ , {a} , {b} , {c} , {a,b} , {a,c} , {b,c} , {a,b,c} , X } and$\propto^*_A$g(Y, σ) = P(Y), SO(X,τ) = P(X)\{d} and S O (Y, σ) = { ϕ , {a} , {a,b} , {a,b,c} , {a,b,d} , Y }.

Let f: (X, τ) ⟶(Y, σ) be a map defined by f (a) = f(d) = a, f(b) = b , f(c) = d. Clearly, f is semi-irresolute but f is not $\propto^*_A$ g - irresolute because f^{-1} ({a}) = {ad} is not $\propto^*_A$ g - open in (X, τ).

Theorem 4.10: Let X, Y and Z be any three topological spaces. For any$\propto^*_A$ g - irresolute map f: (X, τ) ⟶(Y, σ) and any $\propto^*_A$ g - continuous map.Letg: (Y, σ) ⟶(Z , η) , the composition is (g ∘ f): (X, τ) ⟶(Z , η) is$\propto^*_A$ g - continuous.

Proof: Let O be any closed set in Z. Since g is $\propto^*_A$g -continuous g^{-1}(O) is $\propto^*_A$ g - closed in Y. Since f is $\propto^*_A$g -irresolute, f^{-1} (g^{-1}(O)) is $\propto^*_A$ g - closed in X. Butf^{-1} (g^{-1}(O)) = $(g \circ f)^{-1}$. Therefore, (g ∘ f): (X, τ) ⟶(Z , η) is $\propto^*_A$ g - continuous.

Theorem 4.11: Let f: (X, τ) ⟶(Y, σ) and g: (Y, σ) ⟶(Z , η) be any two $\propto^*_A$ g - irresolute functions, then (g ∘ f): (X, τ) ⟶(Z , η) is $\propto^*_A$ g - irresolute

Proof: Let W be a $\propto^*_A$ g - closed set in Z .Since, g is $\propto^*_A$ g - irresolute, g^{-1}(W) is$\propto^*_A$ g -open in Y. Since f is $\propto^*_A$ g - irresolute, f^{-1} (g^{-1}(W)) = $(g \circ f)^{-1}$(W) is $\propto^*_A$ g - open in X. Hence, (g ∘ f): (X, τ) ⟶(Z , η) is $\propto^*_A$ g - irresolute

REFERENCES:

[1] P. Anbarasi Rodrigo and S. Anitha Ruth, $\propto^*_A$generalised – closed sets in topological spaces International Conference on Mathematical Advances and Application 2020(25) ISBN 978-93-90146-09-3.

[2] Biswas,N., On Characterization of Semi-Continuous Functions, *Atti. Accad. Naz. Lincei. Rend. Cl. Sci. Fis. Mat. Natur*. 48(8)1970, 399-402.

[3] S.PiousMissier and P. Anbarasi Rodrigo , Some notion of nearly open sets in Topological Spaces, International Journal Of Mathematical Archive. 4(12) 2013 1-7

[4] Levine, N., Generalized Closed Sets in Topology, *Rend. Circ. Mat. Palermo*.19 (2) (1970), 89-96.

[5] Levine, N., Semi-Open Sets and Semi-Continuity in Topological Space, *Amer. Math. Monthly*. 70 (1963), 36-41.

[6] Njastad, O., On Some Classes of Nearly Open Sets, Pacific *J. Math*. 15(1965) No. (3), 961-970.

[7] Mashhour, A.S., Abd El-Monsef, M.E. and El-Deeb, S.N., On Precontinuous and weak precontinuous mappings. *Proc. Math. Phys. Soc. Egypt*, 53 (1982), 47-53

[8] Maki.H, R.Devi, and K. Balachandran, Associated topologies of generalized α - closed sets and α -generalised closed sets , *Mem . Fac.Sci.KochiUniv.Ser.A Math.*, 15 (1994), 51-63.

[9] Maki.H, R.Devi, and K. Balachandran, Generalized . α - closed sets in topology, *Bull, fukuoka Univ. Ed. Part III*, 42 (1993), 13-21.

[10] Dunham,W., A New Closure Operator for Non-T1 Topologies, *Kyungpook Math. J.* 22 (1982), 55-60.

[11] Robert, A., and S.PiousMissier, S. A New Class of Nearly Open Sets, International Journal of mathematical archive.