b**-t-CONTINUOUS AND **b-t-CONTINUOUS FUNCTIONS IN TOPOLOGICAL SPACES

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ABSTRACT We introduce the notion of b**-pre continuous, b**-semi continuous, b**-t-continuous, b**-t*-continuous, b**-B-continuous, b**-B*-continuous,contra b**-continuous, contra g-b**-continuous, contra s-b**-continuous , **b-pre continuous, **b-semi continuous, **b-t-continuous, **b-t*-continuous, **b-B-continuous, **b-B*-continuous,contra **b-continuous, contra g-**b-continuous, contra s-**b-continuous functions.

Keywords :b**-preopen, b**-semi open, b**-t-set, b**-t*-set, b**-B-set, b**-B*-set, b**-closed, g-b**-closed, s-b**-generalized closed, **b-preopen, **b-semi open, **b-t-set, **b-t*-set, **b-B-set, **b-B*-set, **b-closed, g-**b-closed, s-**b-generalized closed.

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1. INTRODUCTION

Tong [14]introduced the concept of t-set and B-set in topological space.Indira,Rekha[6] introduced**b-open sets,t*-set,B*-set in topological space.Indira,Rekha[7,11,12]introduced *b-t-set,*b-t*-set,*b-B-set,*b-B*-set,*b-preopen,*b-semiopen set, g-*b-closed, s-*b-generalized closed,b**-preopen, b**-semi open, b**-t-set, b**-t*-set, b**-B-set, b**-B*-set, g-b**-closed, s-b**-generalized closed, **b-preopen, **b-semi open, **b-t-set, **b-t*-set, **b-B-set, **b-B*-set, **b-closed, g-**b-closed, s-**b-generalized closed sets in topological spaces.In this paper, we introduce the notion ofb**-t-continuous, b**-t*-continuous, b**-B-continuous, b**-B*-continuous,contra b**-continuous, contra g-b**-continuous, contra s-b**-continuous functions, **b-t-continuous, **b-t*-continuous, **b-B-continuous, **b-B*-continuous,contra **b-continuous, contra g-**b-continuous, contra s-**b-continuous functions. All through this paper (X,τ) and (Y,σ) stand for topological spaces with no separation axioms assumed, unless otherwise stated. Let $A \subseteq X$,the closure of A and the interior of A will be denoted by $Cl(A)$ and $Int(A)$, respectively. A is regular open if $A = Int(Cl(A))$ and A is regular closed if its complement is regular open; equivalently A is regular closed if $A = Cl(Int(A))$.

2. PRELIMINARIES

2.1 Definition A subset A of a space X is said to be:

1. Semi-open [9] if $A \subseteq Cl(Int(A))$

2. Preopen[10] if $A \subseteq Int(Cl(A))$

3. b-open[1] if $A \subseteq Cl(Int(A)) \cup Int(Cl(A))$

4. *b-open[6] if $A \subseteq Cl(Int(A)) \cap Int(Cl(A))$

5. b**-open[3] if $A \subseteq Int(Cl(Int(A))) \cup Cl(Int(Cl(A)))$

6. **b-open[6] if $A \subseteq Int(Cl(Int(A))) \cap Cl(Int(Cl(A)))$

2.2 Definition[7,11,12] A subset A of a space X is said to be:

1. *b-t-set if $Int(A) = Int(*bCl(A))$

2. *b-t*-set if $Cl(A) = Cl(*bInt(A))$

3.*b-B-set if $A = U \cap V$,where $U \in \tau$ and V is a *b-t-set

4.*b-B*-set if $A = U \cap V$, where $U \in \tau$ and V is a *b-t*-set

5.*b-semiopen if $A \subseteq Cl(*bInt(A))$

6.*b-preopen if $A \subseteq Int(*bCl(A))$

7.b**-t-set if $Int(A) = Int(b**Cl(A))$

8. b**-t*-set if $Cl(A) = Cl(b**Int(A))$

9.b**-B-set if $A = U \cap V$,where $U \in \tau$ and V is a b**-t-set

10.b**-B*-set if $A = U \cap V$, where $U \in \tau$ and V is a b**-t*-set

11.b**-semiopen if $A \subseteq Cl(b**Int(A))$

12.b**-preopen if $A \subseteq Int(b**Cl(A))$

13.**b-t-set if $Int(A) = Int(**bCl(A))$

14. **b-t*-set if $Cl(A) = Cl(**bInt(A))$

15.**b-B-set if $A = U \cap V$,where $U \in \tau$ and V is a **b-t-set

16. **b-B*-set if $A = U \cap V$, where $U \in \tau$ and V is a **b-t*-set

17.**b-semiopen if $A \subseteq Cl(**bInt(A))$

18.**b-preopen if $A \subseteq Int(**bCl(A))$

2.3 Definition [3,6,7,11,12]

A subset A of a space X is said to be:

1.generalized *b-closed set if $*bcl(A) \subseteq U$ whenever $A \subseteq U$ and U is open.

2.generalized b**-closed set if $b**cl(A) \subseteq U$ whenever $A \subseteq U$ and U is open.

3. generalized **b-closed set if $**bcl(A) \subseteq U$ whenever $A \subseteq U$ and U is open.

4. s-*b-generalized closed if $s(*bCl(A)) \subseteq U$ whenever $A \subseteq U$ and U is *b-preopen.

5. s-b**-generalized closed if $s(b**Cl(A)) \subseteq U$ whenever $A \subseteq U$ and U is b**-preopen.

6. s-**b-generalized closed if $s(**bCl(A)) \subseteq U$ whenever $A \subseteq U$ and U is **b-preopen.

7. locally *b-closed if $A = U \cap V$, where $U \in \tau$ and V is a *b-closed set.

8. locally b**-closed if $A = U \cap V$, where $U \in \tau$ and V is a b**-closed set.

9. locally **b-closed if $A = U \cap V$, where $U \in \tau$ and V is a **b-closed set.

2.4Definition[8,13]

A function $f : X \to Y$ is called *b-pre continuous(resp.*b-semi continuous,*b-t-continuous,*b-t*- continuous,*b-B-continuous,*b-B*- continuous,contra *b-continuous, contra g-*b-continuous, contra s-*b-continuous, completely continuous, locally b**-closed continuous, locally **b-closed continuous)if $f^{-1}(V)$ is *b-preopen(resp.*b-semiopen,*b-t-set,*b-t*-set,*b-B-set,*b-B*-set,*b-closed, g-*b-closed,s-*b-generalized closed, regular open, locally b**-closed, locally **b-closed)in X for each open set V of Y.

3. b**-t-CONTINUOUS AND b**-B-CONTINUOUS

3.1Definition A function $f : X \to Y$ is called b**-pre continuous if $f^{-1}(V)$ is b**-preopen in X for each open set V of Y.

3.2 Example Let $X = \{a,b,c,d\}$, $\tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$, $Y = \{a,b,c\}$,

$\sigma = \{Y, \phi, \{b\}, \{c\}, \{b,c\}\}$.Define a map $f : X \to Y$ by $f(a) = a;\ f(b) = a;\ f(c) = b;\ f(d) = c$.

Then f is b**-pre continuous.

3.3 DefinitionA function $f : X \to Y$ is calledb**-semi continuous if $f^{-1}(V)$ is b**-semi open in X for each open set V of Y.

3.4 Example Let $X = \{a,b,c,d\}$, $\tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$, $Y = \{a,b,c\}$,

$\sigma = \{Y, \phi, \{b\}\}$. Define a map $f : X \to Y$ by $f(a) = a;\ f(b) = a;\ f(c) = b;\ f(d) = c$.

Then f is b**-semi continuous.

3.5 DefinitionA function $f : X \to Y$ is calledb**-t-continuous if $f^{-1}(V)$ is b**-t-set in X for each open set V of Y.

3.6 Example Let $X = \{a,b,c,d\}$, $\tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$, $Y = \{a,b,c\}$

$\sigma = \{Y, \phi, \{a\}, \{c\}, \{a,c\}\}$. Define a map $f : X \to Y$ by $f(a) = c;\ f(b) = a;\ f(c) = b;\ f(d) = a$

Then f is b**-t-continuous.

3.7 DefinitionA function $f : X \to Y$ is calledb**-t*-continuous if $f^{-1}(V)$ is b**-t*-set in X for each open set V of Y.

3.8 Example Let $X = \{a,b,c,d\}$, $\tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$, $Y = \{a,b,c,d\}$

$\sigma = \{Y, \phi, \{a\}, \{b\}, \{a,b\}, \{a,b,c\}, \{a,b,d\}\}$.Define a map $f : X \to Y$ by

$f(a) = c;\ f(b) = d;\ f(c) = a;\ f(d) = b$.Then f is b**-t*-continuous.

3.9 DefinitionA function $f : X \to Y$ is calledb**-B-continuous if $f^{-1}(V)$ is b**-B-set in X for each open set V of Y.

3.10 Example Let $X = \{a,b,c,d\}, \tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$, $Y = \{a,b,c,d\}$,

$\sigma = \{Y, \phi, \{a,c\}\}$. Define a map $f : X \to Y$ by $f(a) = b;\ f(b) = c;\ f(c) = d;\ f(d) = a$.Then f is b**-B-continuous.

3.11 DefinitionA function $f : X \to Y$ is calledb**-B*-continuous if $f^{-1}(V)$ is b**-B*-set in X for each open set V of Y.

3.12 Example Let $X = \{a,b,c,d\}, \tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$, $Y = \{a,b,c\}$,

$\sigma = \{Y, \phi, \{a\}\}$. Define a map $f : X \to Y$ by $f(a) = c;\ f(b) = b;\ f(c) = a;\ f(d) = b$.

Then f is b**-B*-continuous.

3.13 DefinitionA function $f : X \to Y$ is called Contra b**-continuous if $f^{-1}(V)$ is b**-closed in X for each open set V of Y.

3.14 Example Let $X = \{a,b,c,d\}, \tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$

Define a map $f : X \to X$ by $f(a) = d;\ f(b) = c;\ f(c) = a;\ f(d) = b$.

Then f is Contra b**-continuous.

3.15 DefinitionA function $f : X \to Y$ is called Contra g-b**-continuous if $f^{-1}(V)$ is g-b**-closed in X for each open set V of Y.

3.16 Example Let $X = \{a,b,c,d\}, \tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$.

Define a map $f : X \to X$ by $f(a) = d;\ f(b) = c;\ f(c) = a;\ f(d) = b$.

Then f is Contra g-b**-continuous.

3.17 DefinitionA function $f : X \to Y$ is called Contra s-b**-continuous if $f^{-1}(V)$ is s-b**-generalized closed in X for each open set V of Y.

3.18 Example Let $X = \{a,b,c,d\}, \tau = \{X, \phi, \{c\}, \{d\}, \{c,d\}, \{a,c,d\}, \{b,c,d\}\}$.

Define a map $f : X \to X$ by $f(a) = c;\ f(b) = d;\ f(c) = a;\ f(d) = b.$

Then f is Contra s-b**-continuous.

3.19 Theorem

Let $f : X \to Y$ be a function. Then f is continuous if and only if it is b**-pre continuous and b**-B-continuous.

Proof:Assume that f is continuous.Let V be open in Y .Since f is continuous $\Rightarrow f^{-1}(V)$ is open in X [Since open $\Rightarrow$ b**-preopen and a b**-B-set[11]] $\Rightarrow f^{-1}(V)$ is b**-preopen and a b**-B-set in X . $\Rightarrow f^{-1}(V)$ isb**-preopen and a b**-B-set in X for each open set V of $Y \Rightarrow f$ is b**-pre continuous and b**-B-continuous. Assume that f is b**-pre continuous and b**-B- continuous. Let V be open in Y . Since f is b**-pre continuous and b**-B- continuous $\Rightarrow f^{-1}(V)$ is b**-preopen and b**-B-set in $X \Rightarrow f^{-1}(V)$ is b**-preopen and b**-B-set in X for each open set V of Y [Since b**-preopen and a b**-B-set $\Rightarrow$ open[11]] $\Rightarrow f^{-1}(V)$ is open in X for each open set V of $Y \Rightarrow f$ is continuous.

3.20 Theorem

Let $f : X \to Y$ be a function. Then f is completely continuous if and only if f is b**-pre continuous and b**-t-continuous.

Proof:Assume that f is completely continuous. Let V be open in Y . Since f is completely continuous. $\Rightarrow f^{-1}(V)$ is regular open in X .[Since regular open $\Rightarrow$ b**-preopen and b**-t-set[11]] $\Rightarrow f^{-1}(V)$ isb**-preopen and b**-t-set in $X \Rightarrow f$ is b**-pre continuous and b**-t-continuous. Assume that f is b**-pre continuous and b**-t-continuous. Let V be open in Y .Since f is b**-pre continuous and b**-t-continuous $\Rightarrow f^{-1}(V)$ is b**-preopen and b**-t-set in X [Since b**-preopen and a b**-t-set $\Rightarrow$ regular open[11]] $\Rightarrow f^{-1}(V)$ is regular open in X for each open set V of $Y \Rightarrow f$ is completely continuous.

3.21 Theorem

Let $f : X \to Y$ be a function. Then f is completely continuous if and only if f is b**-pre continuous and contra s-b**-continuous.

Proof:Assume that f is completely continuous. Let V be open in Y .Since f is completely continuous. $\Rightarrow f^{-1}(V)$ is regular open $\Rightarrow f^{-1}(V)$ is b**-preopen and s-b**-generalized closed. [Since regular open $\Rightarrow$ b**-preopen and s-b**-generalized closed[11]] $\Rightarrow f$ is b**-pre continuous and contra s-b**-continuous. Assume that f is b**-pre continuous and contra s-b**-continuous. Let V be open in Y . Since f is b**-pre continuous and contra s-b**-continuous $\Rightarrow f^{-1}(V)$ is b**-preopen and s-b**-generalized closed.[Since b**-preopen and s-b**-generalized closed $\Rightarrow$ regular open11]] $\Rightarrow f^{-1}(V)$ is regular open in X for each open set V of $Y \Rightarrow f$ is completely continuous.

3.22 Theorem

Let $f : X \to Y$ be a function. Then f is contra b**-continuous if and only if it is locally b**-closed-continuous and contra g -b**-continuous.

Proof:Assume that, f is contra b**-continuous. Let V be open in Y .Since f is contra b**-continuous$\Rightarrow f^{-1}(V)$ is b**-closed in X . [Since b**-closed $\Rightarrow$ g-b**-closed and locally b**-closed[11]]$\Rightarrow f^{-1}(V)$ is g-b**-closed and locally b**-closed in X $\Rightarrow f$ is contra-g-b**-continuous and locally b**-closed continuous. Conversely, Assume that f is contra g-b**-continuous and locally b**-closed continuous. Let V be open in Y .Since f is contra-g-b**-continuous and locally b**-closed continuous$\Rightarrow f^{-1}(V)$ is g-b**-closed and locally b**-closed in X [Since g-b**-closed and locally b**-closed $\Rightarrow$b**-closed[11]]$\Rightarrow f^{-1}(V)$ is b**-closed in X $\Rightarrow f^{-1}(V)$ is b**-closed in X for each open set V of Y $\Rightarrow f$ is contra b**-continuous.

4. **b-t-CONTINUOUS AND **b-B-CONTINUOUS

4.1 DefinitionA function $f : X \to Y$ is called**b-pre continuous if $f^{-1}(V)$ is **b-preopen in X for each open set V of Y .

4.2 Example Let $X = \{a,b,c,d\}$, $\tau = \{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$, $Y = \{a,b,c\}$

$\sigma = \{Y,\phi,\{a\},\{b\},\{a,b\}\}$. Define a map $f : X \to Y$ by $f(a) = c;\ f(b) = c;\ f(c) = a;\ f(d) = b$ Then f is **b-pre continuous.

4.3 DefinitionA function $f : X \to Y$ is called**b-semi continuous if $f^{-1}(V)$ is **b-semi open in X for each open set V of Y .

4.4 Example Let $X = \{a,b,c,d\}$, $\tau = \{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$, $Y = \{a,b,c,d\}$

$\sigma = \{Y,\phi,\{c\}\}$. Define a map $f : X \to Y$ by $f(a) = a;\ f(b) = d;\ f(c) = b;\ f(d) = c$

Then f is**b-semi continuous.

4.5 Definition A function $f : X \to Y$ is called**b-t-continuous if $f^{-1}(V)$ is **b-t-set in X for each open set V of Y .

4.6 Example Let $X = \{a,b,c,d\}$, $\tau = \{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$, $Y = \{a,b,c,d\}$

$\sigma = \{Y,\phi,\{b\},\{b,c\}\}$. Define a map $f : X \to Y$ by $f(a) = a;\ f(b) = b;\ f(c) = d;\ f(d) = c$

Then f is**b-t-continuous.

4.7 DefinitionA function $f : X \to Y$ is called**b-t*-continuous if $f^{-1}(V)$ is **b-t*-set in X for each open set V of Y .

4.8 Example Let $X = \{a,b,c,d\}$, $\tau = \{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$, $Y = \{a,b,c,d\}$

$\sigma = \{Y,\phi,\{a\},\{b\},\{a,b\},\{a,b,c\},\{a,b,d\}\}$.Define a map $f : X \to Y$ by

$f(a)=c;\ f(b)=d;\ f(c)=a;\ f(d)=b$. Then f is**b-t*-continuous.

4.9 DefinitionA function $f : X \to Y$ is called**b-B-continuous if $f^{-1}(V)$ is **b-B-set in X for each open set V of Y.

4.10 Example Let $X=\{a,b,c,d\}$, $\tau=\{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$, $Y=\{a,b,c,d\}$

$\sigma=\{Y,\phi,\{b,c\}\}$. Define a map $f : X \to Y$ by $f(a)=b;\ f(b)=c;\ f(c)=d;\ f(d)=a$

Then f is**b-B-continuous.

4.11 DefinitionA function $f : X \to Y$ is called**b-B*-continuous if $f^{-1}(V)$ is **b-B*-set in X for each open set V of Y.

4.12 Example Let $X=\{a,b,c,d\}$, $\tau=\{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$, $Y=\{a,b,c\}$

$\sigma=\{Y,\phi,\{b\}\}$. Define a map $f : X \to Y$ by $f(a)=c;\ f(b)=a;\ f(c)=b;\ f(d)=b$

Then f is**b-B*-continuous.

4.13 DefinitionA function $f : X \to Y$ is called Contra **b-continuous if $f^{-1}(V)$ is **b-closed in X for each open set V of Y.

4.14 Example Let $X=\{a,b,c,d\}$, $\tau=\{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$ .Define a map

$f : X \to X$ by $f(a)=d;\ f(b)=c;\ f(c)=a;\ f(d)=b$ .Then f is Contra **b-continuous.

4.15 DefinitionA function $f : X \to Y$ is called Contra g-**b-continuous if $f^{-1}(V)$ is g-**b-closed in X for each open set V of Y.

4.16 Example Let $X=\{a,b,c,d\}$, $\tau=\{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$ .Define a map

$f : X \to X$ by $f(a)=c;\ f(b)=d;\ f(c)=a;\ f(d)=b$ .Then f is Contra g-**b-continuous.

4.17 Definition A function $f : X \to Y$ is called Contra s-**b-continuous if $f^{-1}(V)$ is s-**b-generalized closed in X for each open set V of Y.

4.18 Example Let $X=\{a,b,c,d\}$, $\tau=\{X,\phi,\{c\},\{d\},\{c,d\},\{a,c,d\},\{b,c,d\}\}$ .Define a map $f : X \to X$ by $f(a)=c;\ f(b)=d;\ f(c)=a;\ f(d)=b$. Then f is Contra s-**b-continuous.

4.19 Theorem

Let $f : X \to Y$ be a function. Then f is continuous if and only if it is **b-pre continuous and **b-B-continuous.

Proof:Assume that f is continuous. Let V be open in Y. Since f is continuous. $\Rightarrow f^{-1}(V)$ is open in X .[Since open$\Rightarrow$**b-preopen and a **b-B-set[12]]. $\Rightarrow f^{-1}(V)$ is**b-preopen and a **b-B-set in X .$\Rightarrow f$ is**b-pre continuous and **b-B-continuous. Assume that f is **b-pre continuous and **b-B- continuous. Let V be open in Y .Since f is **b-pre continuous and **b-B-continuous. $\Rightarrow f^{-1}(V)$ is**b-preopen and **b-B-set in X . [Since **b-preopen and a **b-B-set $\Rightarrow$ open[12]]$\Rightarrow f^{-1}(V)$ is open in X for each open set V of Y .$\Rightarrow f$ is continuous

4.20 Theorem

Let $f : X \to Y$ be a function. Then f is completely continuous if and only if f is **b-pre continuous and **b-t-continuous.

Proof:Assume that f is completely continuous. Let V be open in Y . Since f is completely continuous. $\Rightarrow$ $f^{-1}(V)$ is regular open in X . [Since regular open$\Rightarrow$**b-preopen and **b-t-set[12]]. $\Rightarrow$ $f^{-1}(V)$ is**b-preopen and **b-t-set in X .$\Rightarrow f$ is**b-pre continuous and **b-t-continuous. Assume that f is **b-pre continuous and **b-t-continuous. Let V be open in Y .Since f is **b-pre continuous and **b-t-continuous. $\Rightarrow f^{-1}(V)$ is**b-preopen and **b-t-set in X .[Since **b-preopen and a **b-t-set $\Rightarrow$regular open[12]]$\Rightarrow f^{-1}(V)$ is regular open in X for each open set V of Y .$\Rightarrow f$ is completely continuous.

4.21 Theorem

Let $f : X \to Y$ be a function. Then f is completely continuous if and only if f is **b-pre continuous and contra s-**b-continuous.

Proof:Assume that f is completely continuous. Let V be open in Y . Since f is completely continuous.$\Rightarrow f^{-1}(V)$ is regular open . $\Rightarrow f^{-1}(V)$ is**b-preopen and s-**b-generalized closed[Since regular open$\Rightarrow$**b-preopen and s-**b-generalized closed[12]].$\Rightarrow f$ is**b-pre continuous and contra s-**b-continuous. Assume that f is **b-pre continuous and contra s-**b-continuous. Let V be open in Y . Since f is **b-pre continuous and contra s-**b-continuous. $\Rightarrow f^{-1}(V)$ is**b-preopen and s-**b-generalized closed. [Since **b-preopen and s-**b-generalized closed$\Rightarrow$ regular open[12]]$\Rightarrow f^{-1}(V)$ is regular open in X for each open set V of Y .$\Rightarrow f$ is completely continuous.

4.22 Theorem

Let $f : X \to Y$ be a function. Then f is contra **b-continuous if and only if it is locally **b-closed continuous and contra g -**b-continuous.

Proof:Assume that, f is contra **b-continuous. Let V be open in Y . Since f is contra **b-continuous. $\Rightarrow f^{-1}(V)$ is**b-closed in X . [Since **b-closed $\Rightarrow$ g -**b-closed and locally **b-closed[12]]$\Rightarrow f^{-1}(V)$ is g -**b-closed and locally **b-closed in X .$\Rightarrow f$ is contra-g-**b-continuous and locally **b-closed continuous. Conversely, Assume that f is contra g -**b-continuous and locally **b-closed continuous. Let V be open in Y . Since f is contra-g-**b-continuous and locally **b-closed continuous. $\Rightarrow f^{-1}(V)$ is g-**b-closed and locally **b-closed in X .$\Rightarrow f^{-1}(V)$ is g-**b-closed and locally **b-closed for each open set V of Y .[Since g-**b-closed and locally **b-closed $\Rightarrow$**b-closed[12]]$\Rightarrow f^{-1}(V)$ is**b-closed in X

$\Rightarrow f$ is contra **b-continuous.

CONCLUSION

As an extension of this paper, **b-compact and **b-connected sets in topological spaces can be defined and can obtain theorems based on the above defined concepts.

REFERENCE

[1] D. Andrijevic, "On b-open sets", *Mat. Vesnik*,48(1996), 59-64.
[2] D. Andrijevic, "Semi-preopen sets", *Mat. Vesnik,* 38(1)(1986), 24-32.
[3] S. Bharathi, K. Buvaneshwari, N. Chandramathi, "On Locally b**- closed sets", *International journal of Mathematical Sciences and Applications*, Vol. 1 No. 2(2011)636-641.
[4] T. Hatice and T. Noiri, "Decomposition of continuity and complete continuity", *ActaMath.Hungar*, 113(4) (2006) 278-281.
[5] JulianDontchev, Takashi Noiri, "Contra-semi continuous functions", *Mathematic Pannonica*, 10/2 (1999), 159-168.
[6] T. Indira. , K. Rekha. , "On locally **b-closed sets", *Proceedings of the Heber International Conference on Applications of Mathematics & Statistics,* (HICAMS 2012), 74-80 ISBN No: 978-93-81361-71-9.
[7]T.Indira and K. Rekha, "*b-t-sets in topological spaces", *Antarctica journal of Mathematics* , Vol. 9 No.7 (2012), 599-605.
[8]T. Indiraand K. Rekha,"Applications of *b-open Sets and **b-open Sets inTopological Spaces", *Annals of Pure and Applied Mathematics,*Vol. 1, No. 1, 2012, 44-56.
[9] N. Levine, "Semi-open sets and semi-continuity in Topological spaces", *Amer Math. Monthly* 70(1963), 36-41.
[10] A.S. Mashhour, M.E. Abd El-Monsef and S.N. El-Deep, "On pre-continuous and weak pre-continuous mappings", *Proc. Math. Phys. Soc. Egypt* 53(1982),47-53.
[11] K. Rekha& T. Indira, "b**-t-sets in topological spaces", *Archimedes J. Math*., 3(3)(2013), 209-216.
[12] K. Rekha& T. Indira, "**b-t-sets in topological spaces", *International Journal of Applied Mathematics & Statistical Sciences (IJAMSS)*, Vol. 2, Issue 2, May 2013, 55-64.
[13] K. Rekha& T. Indira, "Decomposition of continuity via *b-open set",*ActaCienciaIndica*,

Vol.XXXIX M, No.1, 73-85(2013).

[14] J.Tong , "On Decomposition of continuity in topological spaces", *Acta Math.Hungar*, 54(1-2)(1989), 51-55.