On Intuitionistic Fuzzy π - Generalized Semi Continuous Mappings

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ABSTRACT
In this paper we have introduced intuitionistic fuzzy π - generalized semi continuous mappings and some of their basic properties are studied.

Keywords
Intuitionistic fuzzy topology, intuitionistic fuzzy π - generalized semi closed sets, intuitionistic fuzzy π - generalized semi continuous mappings, intuitionistic fuzzy $\pi T_{1/2}$ (IF$\pi T_{1/2}$) space and intuitionistic fuzzy $\pi gT_{1/2}$ (IF $\pi gT_{1/2}$) space.

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1. INTRODUCTION
The concept of fuzzy sets was introduced by Zadeh [13] and later Atanassov [1] generalized this idea to intuitionistic fuzzy sets using the notion of fuzzy sets. On the other hand Coker [4] introduced intuitionistic fuzzy topological spaces using the notion of intuitionistic fuzzy sets. In this paper, we introduce intuitionistic fuzzy π - generalized semi continuous mappings and studied some of their basic properties. We arrive at some characterizations of intuitionistic fuzzy π - generalized semi continuous mappings.

2. PRELIMINARIES
Definition 2.1: [1] Let X be a non empty fixed set. An intuitionistic fuzzy set (IFS in short) A in X is an object having the form $A = \{\langle x, \mu_A(x), \nu_A(x) \rangle / x \in X\}$where the functions $\mu_A(x): X \to [0, 1]$ and $\nu_A(x): X \to [0, 1]$ denote the degree of membership (namely $\mu_A(x)$) and the degree of non - membership (namely $\nu_A(x)$) of each element $x \in X$ to the set A, respectively and $0 \leq \mu_A(x) + \nu_A(x) \leq 1$ for each $x \in X$. Denote the set of all intuitionistic fuzzy sets in X by IFS (X).

Definition 2.2: [1] Let A and B be IFS's of the form
$A = \{\langle x, \mu_A(x), \nu_A(x) \rangle / x \in X\}$ and

$B = \{\langle x, \mu_B(x), \nu_B(x) \rangle / x \in X\}$. Then

(a) $A \subseteq B$ if and only if $\mu_A(x) \leq \mu_B(x)$ and $\nu_A(x) \geq \nu_B(x)$ for all $x \in X$,

(b) A = B if and only if $A \subseteq B$ and $B \subseteq A$,

(c) $A^c = \{\langle x, \nu_A(x), \mu_A(x) \rangle / x \in X\}$,

(d) $A \cap B = \{\langle x, \mu_A(x) \wedge \mu_B(x), \nu_A(x) \vee \nu_B(x) \rangle / x \in X\}$,

(e) $A \cup B = \{\langle x, \mu_A(x) \vee \mu_B(x), \nu_A(x) \wedge \nu_B(x) \rangle / x \in X\}$.

For the sake of simplicity, we shall use the notation $A = \langle x, \mu_A, \nu_A \rangle$ instead of $A = \{\langle x, \mu_A(x), \nu_A(x) \rangle / x \in X\}$. Also for the sake of simplicity, we shall use the notation $A = \langle x, (\mu_A, \mu_B), (\nu_A, \nu_B) \rangle$ instead of $A = \langle x, (A/\mu_A, B/\mu_B), (A/\nu_A, B/\nu_B) \rangle$.

The intuitionistic fuzzy sets $0_\sim = \{ \langle x, 0, 1 \rangle / x \in X \}$ and $1_\sim = \{ \langle x, 1, 0 \rangle / x \in X\}$ are respectively the empty set and the whole set of X.

Definition 2.3: [3] An intuitionistic fuzzy topology (IFT in short) on a non empty X is a family τ of IFS in X satisfying the following axioms:

(a) $0_\sim, 1_\sim \in \tau$

(b) $G_1 \cap G_2 \in \tau$, for any $G_1, G_2 \in \tau$

(c) $\cup G_i \in \tau$ for any arbitrary family $\{G_i / i \in J\} \subseteq \tau$.

In this case the pair (X, τ) is called an intuitionistic fuzzy topological space (IFTS in short) and any IFS in τ is known as an intuitionistic fuzzy open set (IFOS for short) in X.

The complement A^c of an IFOS A in an IFTS (X, τ) is called an intuitionistic fuzzy closed set (IFCS for short) in X.

Definition 2.4: [3] Let (X, τ) be an IFTS and $A = \langle x, \mu_A, \nu_A \rangle$ be an IFS in X. Then the intuitionistic fuzzy interior and an intuitionistic fuzzy closure are defined by

$int(A) = \cup \{ G / G$ is an IFOS in X and $G \subseteq A \}$,

$cl(A) = \cap \{ K / K$ is an IFCS in X and $A \subseteq K \}$.

Note that for any IFS A in (X, τ), we have $cl(A^c) = [int(A)]^c$ and $int(A^c) = [cl(A)]^c$.

Definition 2.5: [7] An IFS $A = \{ \langle x, \mu_A, \nu_A \rangle \}$ in an IFTS (X, τ) is said to be an

(i) intuitionistic fuzzy semi open set (IFSOS in short) if $A \subseteq cl(int(A))$,

(ii) intuitionistic fuzzy α-open set (IFαOS in short) if $A \subseteq int(cl(int(A)))$,

(iii) intuitionistic fuzzy regular open set (IFROS in short) if A = int(cl(A)).

The family of all IFOS (respectively IFSOS, IFαOS, IFROS) of an IFTS (X, τ) is denoted by IFO(X) (respectively IFSO(X), IFαO(X), IFRO(X)).

Definition 2.6: [7] An IFS A = ⟨ x, μ_A, ν_A ⟩ in an IFTS (X, τ) is said to be an

(i) intuitionistic fuzzy semi closed set (IFSCS in short) if int(cl(A)) ⊆ A,

(ii) intuitionistic fuzzy α-closed set (IFαCS in short) if cl(int(cl(A)) ⊆ A,

(iii) intuitionistic fuzzy regular closed set (IFRCS in short) if A = cl(int((A).

The family of all IFCS (respectively IFSCS, IFαCS, IFRCS) of an IFTS (X, τ) is denoted by IFC(X) (respectively IFSC(X), IFαC(X), IFRC(X)).

Definition 2.7: [12] Let A be an IFS in an IFTS (X, τ). Then

sint(A) = ∪ { G / G is an IFSOS in X and G ⊆ A },

scl(A) = ∩ { K / K is an IFSCS in X and A ⊆ K }.

Note that for any IFS A in (X, τ), we have $scl(A^c)=(sint(A))^c$ and $sint(A^c) = (scl(A))^c$.

Definition 2.8:[11] An IFS A in an IFTS (X, τ) is an

(i) intuitionistic fuzzy generalized closed set (IFGCS in short) if cl(A) ⊆ U whenever A ⊆ U and U is an IFOS in X.

(ii) intuitionistic fuzzy regular generalized closed set (IFRGCS in short) if cl(A) ⊆ U whenever A ⊆ U and U is an IFROS in X.

Definition 2.9:[10] An IFS A in an IFTS (X, τ) is said to be an intuitionistic fuzzy generalized semi closed set (IFGSCS in short) if scl(A) ⊆ U whenever A ⊆ U and U is an IFOS in (X, τ).

Definition 2.10:[10] An IFS A is said to be an intuitionistic fuzzy generalized semi open set (IFGSOS in short) in X if the complement A^c is an IFGSCS in X.

The family of all IFGSCSs (IFGSOSs) of an IFTS (X, τ) is

denoted by IFGSC(X) (IFGSO(X)).

Definition 2.11:[8] An IFS A in an IFTS (X, τ) is said to be an intuitionistic fuzzy π - generalized semi closed set (IFπGSCS in short) if scl(A) ⊆ U whenever A ⊆ U and U is an IFπOS in (X, τ).

Result 2.12:[8] Every IFCS, IFGCS, IFRCS, IFαCS , IFGSCS is an IFπGSCS but the converses may not be true in general. Every IFαGCS is IFGSCS but the converse is need not be true.

Definition 2.13:[9] An IFS A is said to be an intuitionistic fuzzy alpha generalized open set (IFαGOS in short) in X if the complement A^c is an IFαGCS in X.The family of all IFαGCSs (IFαGOSs) of an IFTS (X, τ) is denoted by IFαGC(X) (IFαGO(X)).

Definition 2.14:[5] Let f be a mapping from an IFTS (X, τ) into an IFTS (Y, σ). Then f is said to be intuitionistic fuzzy continuous (IF continuous in short) if $f^{-1}(B) \in IFO(X)$ for every B ∈ σ.

Definition 2.15:[7] Let f be a mapping from an IFTS (X, τ) into an IFTS (Y, σ). Then f is said to be

(i) intuitionistic fuzzy semi continuous (IFS continuous in short) if $f^{-1}(B) \in IFSO(X)$ for every B ∈ σ.

(ii) intuitionistic fuzzy α- continuous (IFα continuous in short) if $f^{-1}(B) \in IF\alpha O(X)$ for every B ∈ σ.

(iii) intuitionistic fuzzy pre continuous (IFP continuous in short) if $f^{-1}(B) \in IFPO(X)$ for every B ∈ σ.

Result 2.16:[7] Every IF continuous mapping is an IFα-continuous mapping and every IFα-continuous mapping is an IFS continuous mapping.

Definition 2.17:[6] A mapping f: (X, τ) → (Y,σ) is called an intuitionistic fuzzy γ continuous (IFγ continuous in short) if $f^{-1}(B)$ is an IFγOS in (X, τ) for every B ∈ σ.

Definition 2.18:[10] Let f be a mapping from an IFTS (X, τ) into an IFTS (Y, σ). Then f is said to be an intuitionistic fuzzy generalized continuous (IFG continuous in short) if $f^{-1}(B) \in IFGCS(X)$ for every IFCS B in Y.

Result 2.19:[10] Every IF continuous mapping is an IFG continuous mapping.

Definition 2.20:[9] A mapping f: (X, τ) → (Y,σ) is called an intuitionistic fuzzy generalized semi continuous (IFGS continuous in short) if $f^{-1}(B)$ is an IFGSCS in (X, τ) for every IFCS B of (Y, σ).

Definition 2.21:[8] An IFTS (X, τ) is said to be an intuitionistic fuzzy $\pi T_{1/2}$ ($IF\pi T_{1/2}$ in short) space if every IFπGSCS in X is an IFCS in X.

Definition 2.22:[8] An IFTS (X, τ) is said to be an intuitionistic fuzzy $\pi gT_{1/2}$ (IF $\pi gT_{1/2}$ in short) space if every IFπGSCS in X is an IFGCS in X.

3. INTUITIONISTIC FUZZY π - GENERALIZED SEMI CONTINUOUS MAPPINGS

In this section we have introduced intuitionistic fuzzy π - generalized continuous mapping and studied some of its properties.

Definition 3.1: A mapping f: (X, τ) → (Y,σ) is called an intuitionistic fuzzy π - generalized semi continuous (IFπGS continuous in short) if $f^{-1}(B)$ is an IFπGSCS in (X, τ) for every IFCS B of (Y, σ).

Example 3.2: Let X = {a, b}, Y = {u, v} and G_1 = ⟨ x, (0.4, 0.2), (0.6, 0.7) ⟩, G_2 = ⟨ y, (0.7, 0.8), (0.3, 0.2) ⟩. Then τ = {$0_\sim$, G_1, $1_\sim$} and σ = { $0_\sim$, G_2, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFπGS continuous mapping.

Theorem 3.3: Every IF continuous mapping is an IFπGS continuous mapping but not conversely.

Proof: Let f: (X, τ) → (Y, σ) be an IF continuous mapping. Let A be an IFCS in Y. Since f is IF continuous mapping, $f^{-1}(A)$ is an IFCS in X. Since every IFCS is an IFπGSCS, $f^{-1}(A)$ is an IFπGSCS in X. Hence f is an IFπGS continuous mapping.

Example 3.4: Let X = {a, b}, Y = {u, v} and G_1 = ⟨ x, (0.1, 0.1), (0.8, 0.6) ⟩, G_2 = ⟨ y, (0.8, 0.6), (0.1, 0.1) ⟩. Then τ = {$0_\sim$, G_1, $1_\sim$} and σ = { $0_\sim$, G_2, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. The IFS G_2^c = ⟨ y, (0.1, 0.1), (0.8, 0.6) ⟩ is IFCS in Y. Then $f^{-1}(G_2^c)$ is IFπGSCS in X but not IFCS in X. Therefore f is an IFπGS continuous mapping but not an IF continuous mapping.

Theorem 3.5: Every IFα continuous mapping is an IFπGS continuous mapping but not conversely.

Proof: Let f: (X, τ) → (Y,σ) be an IFα continuous mapping. Let A be an IFCS in Y. Then $f^{-1}(A)$ is an IFαCS in X. Since every IFαCS is an IFπGSCS, $f^{-1}(A)$ is an IFπGSCS in X. Hence f is an IFπGS continuous mapping.

Example 3.6: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.7, 0.8), (0.3, 0.1) ⟩, G_2 = ⟨ y, (0.2, 0.3), (0.5, 0.4) ⟩. Then τ = {$0_\sim$, G_1,$1_\sim$} and σ = { $0_\sim$, G_2,$1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. The IFS G_2^c = ⟨ y, (0.5, 0.4), (0.2, 0.3) ⟩ is IFCS in Y. Then $f^{-1}(G_2^c)$ is IFπGSCS in X but not IFαCS in X. Then f is IFπGS continuous mapping but not an IFα continuous mapping.

Theorem 3.7: Every IFR continuous mapping is an IFπGS continuous mapping but not conversely.

Proof: Let f: (X, τ) → (Y,σ) be an IFR continuous mapping. Let A be an IFCS in Y. Then by hypothesis $f^{-1}(A)$ is an IFRCS in X. Since every IFRCS is an IFπGSCS, $f^{-1}(A)$ is an IFπGSCS in X. Hence f is an IFπGS continuous mapping.

Example 3.8: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.3, 0.4), (0.5, 0.6) ⟩, G_2 = ⟨ y, (0.5, 0.6), (0.3, 0.4) ⟩. Then τ = {$0_\sim$, G_1,$1_\sim$} and σ = { $0_\sim$, G_2,$1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. The IFS G_2^c = ⟨ y, (0.3, 0.4), (0.5, 0.6) ⟩ is IFCS in Y. Then $f^{-1}(G_2^c)$ is IFπGSCS in X but not IFRCS in X. Then f is IFπGS continuous mapping but not an IFR continuous mapping.

Theorem 3.9: Every IFG continuous mapping is an IFπGS continuous mapping but not conversely.

Proof: Let f : (X, τ) → (Y, σ) be an IFG continuous mapping. Let A be an IFCS in Y. Since f is an IFG continuous mapping, $f^{-1}(A)$ is an IFGCS in X. Since every IFGCS is an IFπGSCS, $f^{-1}(A)$ is an IFπGSCS in X. Hence f is an IFπGS continuous mapping.

Example 3.10: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.2, 0.8), (0.3, 0.1) ⟩, G_2 = ⟨ y, (0.2, 0.3), (0.5, 4) ⟩. Then τ = { $0_\sim$, G_1, $1_\sim$ } and σ = { $0_\sim$, G_2, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f : (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFπGS continuous mapping. Now consider the IFCS G_2^c = ⟨ y, (0.5, 0.4), (0.2, 0.3) ⟩ in Y. Then $f^{-1}(G_2^c)$ = ⟨ x, (0.5, 0.4), (0.2, 0.3) ⟩ is not an IFGCS in X. Hence f is not an IFG continuous mapping.

Theorem 3.11: Every IFGS continuous mapping is an IFπGS continuous mapping but not conversely.

Proof: Let f: (X, τ) → (Y,σ) be an IFG continuous mapping. Let A be an IFCS in Y. Then by hypothesis $f^{-1}(A)$ is an IFGCS in X. Since every IFGCS is an IFπGSCS, $f^{-1}(A)$ is an IFπGSCS in X. Hence f is an IFπGS continuous mapping.

Example 3.12: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.5, 0.6), (0.2, 0.2) ⟩, G_2 = ⟨ y, (0.6, 0.6), (0.3, 0.2) ⟩. Then τ = {$0_\sim$, G_1,$1_\sim$} and σ = { $0_\sim$, G_2,$1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. The IFS G_2^c = ⟨ y, (0.3, 0.2), (0.6, 0.6) ⟩ is IFCS in Y. Then $f^{-1}(G_2^c)$ is IFπGSCS in X but not IFGSCS in X. Then f is IFπGS continuous mapping but not an IFGS continuous mapping

Theorem 3.13: Every IFαG continuous mapping is an IFπGS continuous mapping but not conversely.

Proof: Let f: (X, τ) → (Y,σ) be an IFαG continuous mapping. Let A be an IFCS in Y. Then by hypothesis $f^{-1}(A)$ is an IFαGCS in X. Since every IFαGCS is an IFGSCS and every IFGSCS is an IFπGSCS, $f^{-1}(A)$ is an IFπGSCS in X. Hence f is an IFπGS continuous mapping.

Example 3.14: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.4, 0.6), (0.2, 0.2) ⟩, G_2 = ⟨ y, (0.6, 0.2), (0.4, 3) ⟩.Then τ = {$0_\sim$, G_1, $1_\sim$} and σ = { $0_\sim$, G_2, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. The IFS G_2^c = ⟨ y, (0.4, 0.3), (0.6, 0.2) ⟩ is IFCS in Y. Then $f^{-1}(G_2^c)$ is IFπGSCS in X but not IFαGCS in X. Then f is IFπGS continuous mapping but not an IFαG continuous mapping.

Remark 3.15: IFP continuous mapping and IFπGS continuous mapping are independent to each other.

Example 3.16: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.2, 0.4), (0.5, 0.4) ⟩, G_2 = ⟨ x, (0.1, 0.3), (0.3, 0.4) ⟩, G_3 = ⟨ x, (0.1, 0.3), (0.5, 0.4) ⟩, G_4 = ⟨ x, (0.2, 0.4), (0.3, 0.4) ⟩, G_5 = ⟨ x, (0.4, 0.4), (0.3, 0.4) ⟩, G_6 = ⟨ y, (0.5, 0.4), (0, 0.3) ⟩. Then τ = { $0_\sim$,G_1,G_2,G_3,G_4,G_5,$1_\sim$ }and σ = {$0_\sim$, G_6, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is IFP continuous mapping but not an IFπGS continuous mapping since G_6^c = ⟨ y, (0, 0.3), (0.5, 0.4) ⟩ is an IFCS in Y but $f^{-1}(G_6^c)$ = ⟨ x, (0, 0.3), (0.5, 0.4) ⟩ is not IFπGSCS in X.

Example 3.17: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.4, 0.2), (0.6, 0.7) ⟩, G_2 = ⟨ y, (0.6, 0.7), (0.4, 0.2) ⟩. Then τ = {$0_\sim$, G_1, $1_\sim$} and σ = {$0_\sim$, G_2, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is IFπGS continuous mapping but not an IFP continuous mapping since G_2^c = ⟨ y, (0.4, 0.2), (0.6, 0.7) ⟩ is an IFCS in Y but $f^{-1}(G_2^c)$ = ⟨ x, (0.4, 0.2), (0.6, 0.7) ⟩ is not IFPCS in X.

Remark 3.18: IFγ continuous mapping and IFπGS continuous mapping are independent to each other.

Example 3.19: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.1, 0.3), (0.4, 0.3) ⟩, G_2 = ⟨ x, (0, 0.2), (0.2, 0.3) ⟩, G_3 = ⟨ x, (0, 0.2), (0.4, 0.3) ⟩, G_4 = ⟨ x, (0.1, 0.3), (0.2, 0.3) ⟩, G_5 = ⟨ x, (0.3, 0.3), (0.2, 0.3) ⟩, G_6 = ⟨ y, (0.3, 0.4), (0, 0.1) ⟩. Then τ = { $0_\sim$,G_1,G_2,G_3,G_4,G_5,$1_\sim$ }and σ = {$0_\sim$, G_6, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is IFγ continuous mapping but not an IFπGS continuous mapping since G_6^c = ⟨ y, (0, 0.1), (0.3, 0.4) ⟩ is an IFCS in Y but $f^{-1}(G_6^c)$ = ⟨ x, (0, 0.1), (0.3, 0.4) ⟩ is not IFπGSCS in X.

Example 3.20: Let X = { a, b }, Y = { u, v } and G_1 = ⟨ x, (0.5, 0.1), (0.5, 0.9) ⟩, G_2 = ⟨ y, (0.2, 0.1), (0.7, 0.8) ⟩. Then τ = {$0_\sim$, G_1, $1_\sim$} and σ = {$0_\sim$, G_2, $1_\sim$} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is IFπGS continuous mapping but not an IFγ continuous mapping since G_2^c = ⟨ y, (0.7, 0.8), (0.2, 0.1) ⟩ is an IFCS in Y but $f^{-1}(G_2^c)$ = ⟨ x, (0.7, 0.8), (0.2, 0.1) ⟩ is not IFγCS in X.

The relations between various types of intuitionistic fuzzy continuity are given in the following diagram. In this diagram 'cts' means continuous.

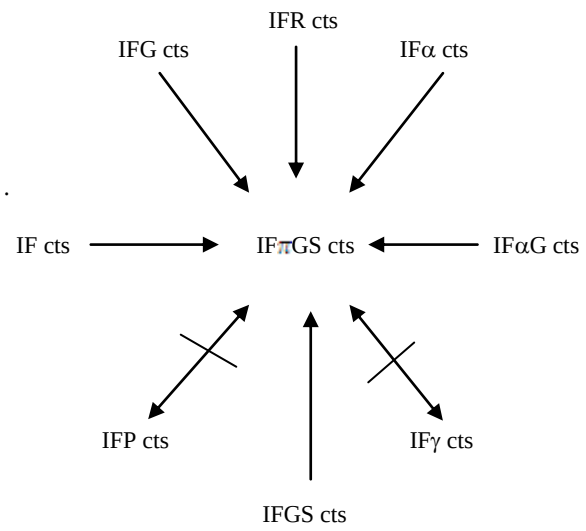

Fig.1 Relation between intuitionistic fuzzy π - generalized semi continuous mappings and other existing intuitionistic fuzzy mappings.

In this diagram by "A ⟶ B" we mean A implies B but not conversely and "A ⟷ B" means A and B are independent of each other.

None of them is reversible

Theorem 3.21: A mapping f: X → Y is IFπGS continuous then the inverse image of each IFOS in Y is an IFπGSOS in X.

Proof: Let A be an IFOS in Y. This implies A^c is IFCS in Y. Since f is IFπGS continuous, $f^{-1}(A^c)$ is IFπGSCS in X. Since $f^{-1}(A^c) = (f^{-1}(A))^c$, $f^{-1}(A)$ is an IFπGSOS in X.

Theorem 3.22: Let f: (X, τ) → (Y, σ) be an IFπGS continuous mapping, then f is an IF continuous mapping if X is an IF $\pi T_{1/2}$ space.

Proof: Let A be an IFCS in Y. Then $f^{-1}(A)$ is an IFπGSCS in X, since f is an IFπGS Continuous. Hence X is an IF $\pi T_{1/2}$ space, $f^{-1}(A)$ is an IFCS in X. Hence f is an IF continuous mapping.

Theorem 3.23: Let f: (X, τ) → (Y, σ) be an IFπGS continuous function, then f is an IFG continuous mapping if X is an IF $\pi gT_{1/2}$ space.

Proof: Let A be an IFCS in Y. Then $f^{-1}(A)$ is an IFπGSCS in X, by hypothesis. Since X is an IF $\pi gT_{1/2}$ space, $f^{-1}(A)$ is an IFGCS in X. Hence f is an IFG continuous mapping.

Theorem 3.24: Let f : (X, τ) → (Y, σ) be an IFπGS continuous mapping and g : (Y, σ) → (Z, δ) is IF continuous, then g o f : (X, τ) → (Z, δ) is an IFπGS continuous.

Proof: Let A be an IFCS in Z. Then $g^{-1}(A)$ is an IFCS in Y, by hypothesis. Since f is an IFπGS continuous mapping, $f^{-1}(g^{-1}(A))$ is an IFπGSCS in X. Hence g o f is an IFπGS continuous mapping.

4. CONCLUSION

In this paper we have introduced intuitionistic fuzzy π-generalized semi continuous mappings and studied some of its basic properties. Also we have studied the relationship between intuitionistic fuzzy generalized continuous mappings and some of the intuitionistic fuzzy continuous mappings already exist.

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