International Journal of Mathematics and Statistics Invention (IJMSI)
E-ISSN: 2321- 4767 P-ISSN: 2321-4759
www.ijmsi.org Volume 9 Issue 5 || May, 2021 || PP 01-06

On Nano g**Λ- Closed Sets

R.Madhumitha[1], V.SenthilKumaran[2], Y.Palaniappan[3]
[1]*M.Phil scholar , Arignar Anna Government Arts College, Musiri, Tamilnadu, India.*
[2]*Associate Professor Of Mathematics, Arignar Anna Government Arts College, Musiri, Tamilnadu, India.*
[3] *Associate Professor Of Mathematics (Retd).Arignar Anna Government Atrs College Musiri, Tamilnadu,India*

ABSTRACT: *In this paper we introduced a new class of closed sets callednano g**Λ- closed sets in nano topological spaces The property of the sets are studied and its relation to the various sets are investigated. We also introduce a new type of closed map called nano g**Λ-closed map and study its relation to other maps.*
KEYWORDS: *Nano topology , Nano closed, Nano* $g^{**}\Lambda - closed$
2010 AMS subject classification:54A05, 54B05, 54C10.

Date of Submission: 08-05-2021 Date of Acceptance: 22-05-2021

I. INTRODUCTION

Lelli'sThivagar etal [7] introduced nano topological space with respect to a subset X of an universe which is defined interms of lower and upper approximations of X. The elements of nano topological space are called as nano open sets. Nano has origin in the Greek word 'nanos' which means 'dwarf' in its modern scientific sense The concerned topology is called Nano topology as atmost it can have five elements.

Levine [8] studied generalized closed sets in topological spaces. Veerakumar [12] investigated g*-closed sets. Maki[9] introduced Λ sets. A Λ set is a set A which is equal to its kernel,(ie) the intersection of all open supersets of A Arenas eatal [1]studiedλ closed sets by using closed sets and Λ sets. Balamani[2] introduced and investigated g**Λ-closed sets which contains the class of g* Λ- closed sets and contained in the class of gΛ- closed sets .

II. PRELIMINARIES

The following recalls necessary concepts and preliminaries required in the sequel of our work.

DEFINITION:2.1:

A subset A of a topological spaces (X,τ) is called
(1)Regular closed [11] if A= cl int (A).
(2) Generalized closed (g -closed) [8] if cl(A)⊂U whenever A⊂U, U is open in (X,τ).
(3) g*- closed [12] if cl(A)⊂U whenever A⊂U and U is g-open in (X,τ).
(4) λ-closed [1] if A=C∩D where C is Λ set and D is a closed set.
(5) gΛ-closed [5] if $cl_\lambda(A)$⊂U whenever A⊂U and U is open in (X,τ).
(6) Λ g-closed [5] if $cl_\lambda(A)$⊂U whenever A⊂U and U is λ-open in (X,τ).
(7) gΛ-closed [10] if $cl_\lambda(A)$⊂U whenever A⊂U and U is g-open in (X,τ).
(8) g**Λ- closed [2] if $cl_\lambda(A)$⊂U whenever A⊂U and U is g*-open in (X,τ).
The intersection of all λclosed sets containing A is called the λ-closure of A and is denoted by $cl_\lambda(A)$ [4].
The complements of the above mentioned closed sets are respectively open sets.

DEFINITION:2.2:[7]

Let U be a non-empty finite set of objects called the universe $\mathcal{R}$be an equivalence relation on U named as the indiscerniblity relation. Elements belonging to the same equivalence class are said to be indiscernible with one another. The pair$(U,\mathcal{R})$ is said to be the approximation space. Let $X \subset U$.
(i)The Lower appproximation of X with respect to $\mathcal{R}$ is the set of all objects, which can be for certain classified as X with respect to $\mathcal{R}$ and it is denoted by $L_\mathcal{R}$(X).That is,$L_\mathcal{R}$(X) ={ $\cup_{X\epsilon U}\{\mathcal{R}(X): \mathcal{R}(X) \subset X\}$}, where$\mathcal{R}$(X) denotes the equivalenceclass determined by X.

(ii) The Upper approximation of X with respect to $\mathcal{R}$ is the set of all objects, whichcan be possibly classified as X with respect to $\mathcal{R}$ and it is denoted by
$U_\mathcal{R}$(X) ={ $\cup_{X\epsilon U}\{\mathcal{R}(X): \mathcal{R}(X) \cap X \neq \phi\}$,

(iii) The Boundary region of X with respect to $\mathcal{R}$ is the set of all objects which canbe classified neither as X nor as not -X with respect to $\mathcal{R}$ and it is denoted by
$B_{\mathcal{R}}$(X) =$U_{\mathcal{R}}$(X) -$L_{\mathcal{R}}$(X).

DEFINITION:2.3:[7]
Let U be the universe, $\mathcal{R}$ be an equivalence relation on U and
$\tau_{\mathcal{R}}$(X)= $\{U,\phi, L_{\mathcal{R}}(X),U_{\mathcal{R}}(X),B_{\mathcal{R}}(X)\}$ where $X \subset U$ and $\tau_{\mathcal{R}}$(X) satisfies the following axioms.
(i) U and$\phi \in \tau_{\mathcal{R}}$(X)
(ii) The union of the elements of any subcollection$\tau_{\mathcal{R}}$(X)is in$\tau_{\mathcal{R}}$(X).
(iii) The intersection of the elements of any finite subcollection of $\tau_{\mathcal{R}}$(X) is in $\tau_{\mathcal{R}}$(X).
That is,$\tau_{\mathcal{R}}$(X) forms a topology U called as the nano topology on U with respect to X.We call (U,$\tau_{\mathcal{R}}$(X)) as the nano topological space. The elements of $\tau_{\mathcal{R}}$(X) are called asnano open sets. A set A is said to be nano closed if its complement is nano open.

DEFINITION:2.4:[7]
If (U,$\tau_{\mathcal{R}}$(X)) is a nano topological space with respect to X where $X \subset U$ and if $A \subset U$, then nano interior of A is defined as the union of all nano open subsets contained in A and its denoted by $NInt(A)$. That is $NInt(A)$ is the largest nano open subset contained in A.
The nano closure of A is defined as the intersection of all nano closed sets containing A and its denoted by $NCl(A)$. That is, $NCl(A)$ is the smallest nano closed set containing A.

DEFINITION:2.5:
A subset A of a nano topological spaces (U,$\tau_{\mathcal{R}}$(X)) is called
(1) Nano regular closed if A= Ncl Nint (A).
(2) Nano generalized closed (nanog -closed) if Ncl(A)⊂U whenever A⊂U, U is nano open in (U,$\tau_{\mathcal{R}}$(X))
(3) Nano g*-closed if N cl(A)⊂U whenever A⊂U and U isnanog- open in (U,$\tau_{\mathcal{R}}$(X))
(4)Nano $\lambda-$closed if A=C∩D where C is nano Λ set and D is a nanoclosed set.
(5)Nano gΛ- closed if $Ncl_{\lambda}(A)$⊂U whenever A⊂U and U is nanoopen in (U,$\tau_{\mathcal{R}}$(X))
(6)Nano Λ g-closed if $Ncl_{\lambda}(A)$⊂U whenever A⊂U and U is a nanoλ-open in (U,$\tau_{\mathcal{R}}$(X))
(7)Nano g^{*}Λ-closed if N$cl_{\lambda}(A)$⊂U whenever A⊂U and U isnano g-open in (U,$\tau_{\mathcal{R}}$(X))
The intersection of allnanoλclosed sets containing A is called thenanoλ-closure of A and is denoted by N$cl_{\lambda}(A)$.
The complements of the above mentioned nano closed sets are respectivelynano open sets.

III. NANO g^{**}Λ CLOSED SETS

DEFINITION:3.1
A subset A of a nano topological space (U,$\tau_{\mathcal{R}}$(X)) is called nano g **Λ -closed set if N cl_{λ} (A) ⊂U whenever A⊂Uand U is nano g * -open in (U,$\tau_{\mathcal{R}}$(X))

REMARK:3.2:
(1) Every nanoΛ set is a nano λ- closed set.
(2) Every nano open and nano closed sets are nanoλ- closed sets.

THEOREM:3.3:
Every nano λ -closed set is nano g **Λ -closed set.
PROOF:
Let A be a nano λ -closed set of (U,$\tau_{\mathcal{R}}$(X)) Let U be any nanog * -open set containing A in X. Since A is nano λ -closed,Ncl_{λ} (A)= A⊂ U. Hence A isnano g **Λ - closed.

The converse of the above theorem need not be true can be seen from the following example.

EXAMPLE:3.4:
Let U={a,b,c,d}U/R ={{a},{c},{b,d}}
X={a,b}
$\tau_{\mathcal{R}}$(X)={U,ϕ ,{a},{a,b,d},{b,d}}
{b,c} is a nanog **Λ – closed but not nano λ –closed.

THEOREM:3.5:
Every nano closed set in (U,$\tau_{\mathcal{R}}$(X)) is nano g **Λ- closed but not conversely.

PROOF:
The proof follows from Remark-3.2 and Theorem-3.3.

EXAMPLE:3.6:
Refer the previous Example-3.4, {b,c} is nano g **Λ- closed but not nano closed.

THEOREM:3.7:
Every nano open set in (U,$\tau_{\mathcal{R}}$(X)) is nano g **Λ- closed but not conversely.
PROOF:
The proof follows from Remark-3.2 and Theorem-3.3.

EXAMPLE:3.8:
Refer the previous Example-3.4, {b,c} is nano g **Λ- closed but not nano open.

THEOREM:3.9:
Every nano regular closed set in (U,$\tau_{\mathcal{R}}$(X)) is nano g **Λ- closed but not conversely.
PROOF:
The proof follows from that every nano-regular closed set is a nano closed set and by Theorem-3.5.

EXAMPLE:3.10:
Refer the previous Example-3.4, {b,c} is nano g **Λ- closed but not nano regular closed.

THEOREM:3.11:
Every nano Λ set in (U,$\tau_{\mathcal{R}}$(X)) is nano g **Λ- closed but not conversely
PROOF:
Refer the previous theorem-3.4, {b,c} is nano g **Λ- closed set but not nano Λ set.

THEOREM:3.12:
Every nanog *-closed set in (U,$\tau_{\mathcal{R}}$(X)) is nano g **Λ- closed but not conversely
PROOF:
Let A be a nano g * -closed set of (U,$\tau_{\mathcal{R}}$(X)). Let U be any nano g * -open set containing A in X. Since every nano g * -open is nano g - open and A is a nano g * -closed set N cl(A)⊂ U. Since every nano closed set is a nano λ closed, N cl_{λ} (A) ⊂ cl(A)⊂ U. Hence A is nano g **Λ- closed.

EXAMPLE:3.13:
Refer the previous Example-3.4, {a} is nano g *Λ- closed set but not nano g * closed set.

THEOREM:3.14:
Every nano g *Λ- closed set in (U,$\tau_{\mathcal{R}}$(X)) is nano g **Λ- closed but not conversely.
PROOF:
Let A be a nano g *Λ- closed set of a (U,$\tau_{\mathcal{R}}$(X)). Let A⊂U where U is nano g*- open . As every nano g*-open sets is nano g-open and A is nano g* Λ -closed set, N cl_{λ} (A) ⊂ U. Hence A is nano g **Λ- closed.

EXAMPLE:3.15:
Let U={a,b,c},U/R={a,{b,c}} X={a}
$\tau_{\mathcal{R}}$(X)={a}
{b} is nano g** Λ- closed but nano g* Λ- closed.

THEOREM:3.16:
Every nano g** Λ- closed set in (U,$\tau_{\mathcal{R}}$(X)) is nano g Λ- closed but not conversely.
PROOF:
Let A be a nano g** Λ- closed set of (U,$\tau_{\mathcal{R}}$(X)). Let A⊂U, U be a nano – open set. Since every nano open set is nano g*- open and A is nano g** Λ- closed set, N cl_{λ} (A) ⊂ U. Hence A is nano g Λ- closed

EXAMPLE:3.17:
Refer the example-3.4 {b} is a nano g Λ- closed set
but notnano g** Λ- closed set.

IV. PROPERTIES OF g* Λ- CLOSED SETS.

THEOREM:4.1:
Let A be a nanog**Λ -closed subset of **(U,τ□(X))**. Then Ncl$_\lambda$(A)-A contains no non-empty nano closed set in X.
PROOF:
Suppose that A is a nanog**Λ -closed. Let F be a non emptynano closed subset of N cl$_\lambda$(A)-A.Then F^c is nanoopen and hencenanog*-open such that A⊆F^c.Since A is ananog**Λ -closed set, Ncl$_\lambda$(A)⊆F^c.ThusF⊆ (N cl$_\lambda$(A))^c. Since every nanoclosed set isnanoλ -closed, F isnanoλ -closed. Hence F⊆ Ncl$_\lambda$(A).Therefore F⊆ [(Ncl$_\lambda$(A))^c ∩ N cl$_\lambda$(A)]=φ. Hence F=ϕ .
REMARK:4.2:
The converse of the above theorem is not true as seen from the following example.
EXAMPLE:4.3:
Refer the example – 3.4 A={b} then N cl$_\lambda$(A)-A={b,d}-{b}={d} does not contain non-empty nanoclosed set. However A is not nano g**Λ -closed.
THEOREM.4.4:
If a subset A is nanog**Λ -closed in (U,$\tau_{\mathcal{R}}$(X)), then N cl$_\lambda$(A)-A contains no non-empty nanog*-closed set.
PROOF:
Let A be ananog**Λ -closed set. Let F be ananog* -closed set contained in Ncl$_\lambda$(A)-A. Then F^c is ananog*-open set in X such that A⊆F^c.Since A is ananog**Λ -closed set of X, N cl$_\lambda$(A)⊆F^c.ThusF⊆ (Ncl$_\lambda$(A))^c. Also F⊆ Ncl$_\lambda$(A)-A.Therefore F⊆ [(N cl$_\lambda$(A))^c ∩N cl$_\lambda$(A)]= φ. Hence F = φ.
THEOREM 4.5:
If a subset A is nanog*-open andnanog**Λ -closed set in (U,$\tau_{\mathcal{R}}$(X)),then A is ananoλ -closed set of X.
PROOF:
Since A is nanog*-open and nanog**Λ -closed,Ncl$_\lambda$(A)⊆A.Hence A isnanoλ -closed.
THEOREM: 4.6:
Let A be nanog**Λ -closed and nanog*-open in (U,$\tau_{\mathcal{R}}$(X)). If G isnanoλ -closed in (U,$\tau_{\mathcal{R}}$(X)), then A∩G isnanog**Λ -closed.
PROOF:
Since A is nanog**Λ -closed andnanog*-open, A is nanoλ -closed by theorem 4.5. Therefore if G is nanoλ-closed in X, then A∩G is nanoλ -closed in X, as the intersection of nanoλ -closed sets is a nanoλ -closed set. Hence by the theorem 3.3, A∩G isnanog**Λ -closed .
THEOREM:4.7:
If A is a nanog**Λ -closed set in (U,$\tau_{\mathcal{R}}$(X)) and A⊆ B⊆ Ncl$_\lambda$(A),then B is also ananog**Λ -closed set.
PROOF:
Let U be ananog*-open set of (X,τ) such that B⊆U.Then A⊆U. Since A is a nanog**Λ -closed set, N cl$_\lambda$(A)⊆ U. Also since B⊆N cl$_\lambda$(A), Ncl$_\lambda$(B)⊆ Ncl$_\lambda$(N cl$_\lambda$(A))= **N** cl$_\lambda$(A).Hence N cl$_\lambda$(B)⊆ U. Therefore B is also ananog**Λ -closed set in (U,$\tau_{\mathcal{R}}$(X))
THEOREM:4.8:
LetA be ananog**Λ -closed set in (U,$\tau_{\mathcal{R}}$(X)). Then A isnanoλ -closed if and only if N cl$_\lambda$(A)- Ais nanog*-closed.
PROOF:
NECESSARY PART:
Let A be ananoλ -closed subset of (U,$\tau_{\mathcal{R}}$(X)).Then Ncl$_\lambda$(A) = A and therefore N cl$_\lambda$(A)-A = φwhich is nanog*-closed.
SUFFICIENT PART:
Let N cl$_\lambda$(A)– Abe a nano g* -closed set. Since A is nanog**Λ -closed by theorem 4.4 Ncl$_\lambda$(A)- Acontains no non- empty nanog* -closed set which implies N cl$_\lambda$(A)-A = φ .That is N cl$_\lambda$(A) = A.Therefore A is nanoλ -closed.
THEOREM:4.9:
For each x∈X either {x} is nano g*-closed or X-{x} is nanog**Λ -closed in (U,$\tau_{\mathcal{R}}$(X)).
PROOF:
Let x∈X and suppose that {x} is not nano g*- closed in X. Then X-{x} is notnanog*-open in X. Hence X is the only nanog*-open set containing X-{x}. That is (X-{x})⊆X. Hence N cl$_\lambda$(X-{x})⊆X which implies that X-{x} isnanog**Λ -closed in (U,$\tau_{\mathcal{R}}$(X)).
DEFINITION:4.10:
The intersection of all nano g*-open subsets of (U,$\tau_{\mathcal{R}}$(X)) containing A is called nanog*-kernal ofA and is denoted bynanog*-ker(A)
(i.e) nanog*-ker(A)=∩{U / U is nano g*-open in(U,$\tau_{\mathcal{R}}$(X)) and A ⊆U}

THEOREM:4.11:
A subset A of $(U,\tau_{\mathcal{R}}(X))$ is nano g**Λ -closed if and only if $Ncl_{\lambda}(A)\subseteq$nano g*-ker(A).
PROOF:
Suppose that A is nano g**Λ -closed in $(U,\tau_{\mathcal{R}}(X))$.Then N $cl_{\lambda}(A)\subseteq U$ whenever $A\subseteq U$ and U is nano g*- open in (X,τ). Let x∈N $cl_{\lambda}(A)$. If x∉ nano g*-ker(A), then there exists a set U $\in g^*O(U,\tau_{\mathcal{R}}(X))$ such that x∉U and A⊆U. Since U is a nanog*- open set containing A, we have x not belongs to N $cl_{\lambda}(A)$, a contradiction. Conversely, let $Ncl_{\lambda}(A)\subseteq$nanog*-ker(A). If U is any nanog* -open set containing A, then $Ncl_{\lambda}(A)\subseteq$nano g*-ker(A) we have $Ncl_{\lambda}(A)\subseteq U$. Hence A isnanog**Λ –closed
.

V. NANO g**Λ – CLOSED FUNCTION.

DEFINITION:5.1:
Let $(U,\tau_{\mathcal{R}}(X))$, $(V,\tau_{\mathcal{R}}(Y))$ be nano topological spaces.
(i)A function f: U→V is said to be nano λ -closed if f(A) is nano λ –closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

(ii)A function f: U→V is said to be nano closed if f(A) is nano closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

(iii) A function f: U→V is said to be nano regular closed if f(A) is nano regular closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

(iv) A function f: U→V is said to be nano Λ -closed if f(A) is nano Λ –closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

(v) A function f: U→Vis said to be nano g* -closed if f(A) is nano g* –closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

(vi) A function f: U→V is said to be nano g* Λ -closed if f(A) is nano g* Λ –closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

(vii) A function f: U→V is said to be nano gΛ -closed if f(A) is nanogΛ –closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

(viii) A function f: U→V is said to be nano g**Λ -closed if f(A) is nano g**Λ –closed in $(V,\tau_{\mathcal{R}}(Y))$ for every nano closed set A in $(U,\tau_{\mathcal{R}}(X))$.

THEOREM:5.2:
(A) Every nano λ-closed function is nano g**Λ -closed function.
(B) Every nano closed function is nano g**Λ -closed function.
(C) Every nano open function is nano g**Λ -open function.
(D) Every nano regular closed function is nano g**Λ - closed function.
(E) Every nano Λ - closed function is a nano g**Λ -closed function.
(F) Every nano g*-closed function is a nano g**Λ -closed function.
(G) Every nano gΛ -closed function is nano g**Λ -closed function.
(H) Every nano g**Λ -closed function is nano gΛ -closed function.

PROOF:
The proof is straight forward.
The converse of the above need not be true can be seen from the following examples.

EXAMPLE: 5.3:
Refer the example-3.4 define let $(U,\tau_{\mathcal{R}}(X)) = (V,\tau_{\mathcal{R}}(Y))$ f :U→ V by f(a) = d, f(b)=b, f(c)= c, f(d)=a
f is nano g**Λ -closed function but not λ-closed function,as f({b,c,d})={a,b,c} is not nanoλ-closed.

EXAMPLE: 5.4:
Refer the previous example-5.3define f is nano g**Λ -closed function but not a nano closed function,as f({a,c})={c,d} is not nano closed.

EXAMPLE: 5.5:
Refer the previous example-5.3 define f is not g**Λ -closed function but not a nano open function,as f({a})={d} is not nano open.

EXAMPLE: 5.6:
Refer the previous example-5.3 define f is nano g**Λ -closed function but not a nano regular closed function,as f({b,c,d})={a,b,c} is not nano regular closed.

EXAMPLE: 5.7:
Refer the previous example-5.3 define f is nano g**Λ -closed function but not Λ - closed function,as f({b,c,d})={a,b,c} is not nano Λ - closed.

EXAMPLE: 5.8:
Refer the previous example-5.3 define f::U→ $V$by f(a)=a,f(b)=b,f(c)=a,f(d)=c then f is nano g**Λ -closed function but not g* - closed function,as
f({c})={a} is not nanog*- closed.

EXAMPLE: 5.9:
Refer the example -3.15 let $(U,\tau_{\mathcal{R}}(X)) = (V,\tau_{\mathcal{R}}(Y))$ f :U→V
Let f(a) = a, f(b)=b, f(c)= a.
f is nano g** Λ -closed function but not nano g*Λ - closed function f({b,c})={a,b} is not a nano g*Λ - closed.

REFERENCES

[1]. F.G.Arenas J.Dontchev and M.Ganster, , On λ sets and duel of generalized continuityQuestions and Answers general topology(1999), 3-13
[2]. N.Balamani, g**Λ –closed sets in topological spacesWaffen-Und and Kostumukunde Journal .Vol XI issue III December 2020,1-7.
[3]. K.Bhuvaneswari and K.Mythili Gana Priya Nano generalized closed sets , International Journal of Scientific and Research Publication 4(5) (2014), 1-3.
[4]. M.Caldas , S.Jafari and G.Navalagi, More on λ- closed sets in topological spaces, RevistaColombiana de Mathematicas Vol (41) (2007), 355-369.
[5]. M.Caldas , S.Jafari and T.Noiri,On Λ generalized closed sets in topological spaces Acta Math Hungarica Vol118(4)(2008), 333-343.
[6]. P.Jeyalakshmi , On nanogb* closed sets , International Journal of Pure and Applied Mathematics Vol-11 No-1 (2018), 35-43.
[7]. M.LellisThivagar and Carmel Richard, On nano forms of weakly open sets, International Journal of Mathematics and Statics invention 1(1) (2013), 31-37.
[8]. N. Levine , Generalized closed sets in topology Rend.Circ.Mat.Palermo. Vol-19 (2), (1970), 89-96
[9]. H.Maki, Generalized Λ -closed sets and the associated closure operator, The special issue in commomoaration of Professor Kazusada Ikeda's Retirement (1986), 139-146
[10]. S.PiousMisser and Vijilius Helena Raj, g*Λ- closed sets in topological spaces, International Journal of Contemporary Mathematical Sciences Vol-7 ((20) (2012) ,963-974.
[11]. M.Stone, Application of the theory of Boolean rings to general topology Trans. Amer.Math.Soc. Vol-41 (1937), 374-481.
[12]. M.K.R.S. Veerakumar,Between closed and g closed sets Mem..Fac.Sci.Kochi.Univ.Math Vol-21 (2009), 1-19.

R.Madhumitha, et. al. "On Nano g**Λ- Closed Sets." *International Journal of Mathematics and Statistics Invention (IJMSI)*, vol. 09(05), 2021, pp. 01-06.