

INTRODUCTION

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Topology has a tremendous application in computer graphics, image processing, digital image and digital pictures etc. In 1961, Levine [32] introduced the concept of semi-continuous function. Levine [31] in 1970 introduced the notion of generalized closed sets in topological spaces and showed that compactness, countable compactness, Para compactness and normality etc. are all g -closed hereditary. Also he introduced a separation axiom called $T_{1/2}$ between T_1 and T_0 . Recently many modifications were defined and investigated. They are applied to introduce several low separation axioms, especially Sundaram and Pushpalatha [63] introduced strongly generalized closed sets and two new separation axioms T_S and T_P .

Bhattacharya and Lahari [11] introduced the notions of sg -closed sets and Arya and Nour [6] introduced the notions of gs -closed sets in topological spaces. Aslim [8] introduced the concepts of π -closed sets, πg -closed sets and πgp -closed sets and obtained the relations between the sets and studied different notions continuous functions and irresolute functions. Veerakumar [67] introduced the concepts \tilde{g} -closed sets, $\#g$ -closed sets, $\#gs$ -closed sets, \tilde{g} -closed sets. Sundaram et.al [65] has introduced the concepts $\tilde{g}s$ -closed sets in topological spaces.

In 2007, Rajesh [61] introduced the notions of λ -closed sets and he related it with the notions of \tilde{g} -closed sets, $\#g$ -closed sets, $\tilde{g}s$ -closed sets in topological spaces, Rajesh et.al.[61] studied the different notions of continuous functions and irresolute functions.

In 2006, Noiri and Popa [52] introduced the concept of minimal spaces and defined m_X -open sets, m_X -closed sets, m -continuous functions and m_X -cl, m_X -int operators and discussed some of its basic properties. Noiri introduced the concept of mg -closed sets in minimal structures which is analogs to g -closed sets in topological space introduced by Levine. Nagaveni [44] introduced wg -closed sets and investigated the properties of these sets.

In 2009, Rosas et.al [21] have investigated some new types of open and closed sets in minimal structure and generalized many results obtained due to Asilm [8].

In this dissertation we have focused our attention to study various forms of generalized closed sets namely strongly generalized closed sets, weakly generalized closed sets and generalized continuous and generalized irresolute maps in minimal structures.

The following articles are chosen for our discussion.

- (i) Generalized closed sets in topological spaces by N. Levine [31].
- (ii) Strongly generalized closed sets in topological spaces by P. Sundaram and A.Puspalatha [63].
- (iii) Strongly generalized closed sets in minimal structures by A.Puspalatha and E.Subha [60].
- (iv) Weakly generalized closed sets in topological spaces by P. Sundaram and N.Nagaveni [64].
- (v) Weakly generalized closed sets in minimal structures by R.Parimelazhagan, K.Balachandran and N.Nagaveni [55].
- (vi) On mg -continuous functions in minimal structures by R.Parimelazhagan, N.Nagaveni and Sai Sundara Krishnan [54].
- (vii) Some new types of open and closed sets in minimal structures I&II

by Ennis Rosas, Neelamegarajan Rajesh and Carlos Carpintero [22,23].

In chapter 1, the first section deals with preliminary definitions that are needed for our study. Second section deals with the concept of strongly generalized closed sets due to Sundaram and Puspalatha [63] and weakly generalized closed sets due to Sundaram and Nagaveni [64] in topological spaces. The third section deals with the concept of weakly generalized continuous maps due to Sundaram and Nagaveni [64] in topological spaces. Properties and characterizations of these sets and maps are analyzed.

In chapter 2, the first section deals with preliminary definitions needed for our study. Second section deals with the concept of smg-closed sets due to Puspalatha and Subha [60]. This is a modification of strongly generalized closed sets due to Sundaram and Puspalatha [63]. Third section deals with mg-continuous maps in minimal structures due to Parimelazhagan, Nagaveni and Sai Sundara Krishnan [54]. Basic properties and characterizations of mg-continuous mapping are discussed. Fourth and fifth section deals with the concept of mwg-closed sets and mwg-continuous maps in minimal structures due to Parimelazhagan, Balachandran and Nagaveni [55]. This set is a weaker form of a mg-closed set in minimal structure introduced by Noiri.

In chapter 3, devoted to study of some new types of generalized closed sets, open sets, continuous and irresolute maps in minimal structures due to Ennis Rosas, Neelamegarajan Rajesh and Carlos Carpintero [22, 23]. Section one deals with preliminary definitions needed for our study. Section

two deals with various generalizations of closed sets namely gs-closed set, sg-closed set, π -closed set, π g-closed set, π gs-closed set, gp-closed set, π gp-closed set, \tilde{g} -closed set, $\#$ g-closed set, \tilde{g} s-closed set, λ -closed sets in minimal structures. Basic properties and characterization of these sets are analyzed. Section three deals with different types of continuous maps and irresolute maps on minimal structures. Properties of these functions and interrelationships between these maps and with other generalized continuous maps are analyzed.