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List of Publications

1. Sasikala D, Deepa M, A note on connectedness on Topological space, *Advances in Mathematics: Scientific journal*, 9(2020), 1-10. (Scopus)

2. Sasikala D, Deepa M, An elementary approach on hyperconnected spaces, *Turkish Journal of Computer and Mathematics Education*, 12(2021), 946-950. (Scopus)

3. Sasikala D, Deepa M, A new perspective of neutrosophic hyperconnected spaces, *Neutrosophic Sets and Systems* (Communicated)

4. Deepa M, Sasikala D, Neutrosophic resolvable sets and neutrosophic resolvable functions, *Southeast Asian Journal of Mathematics and Mathematical sciences.* (Communicated)

5. Deepa M, Sasikala D, A new conception of sets in neutrosophic hyperconnected spaces, *Neutrosophic sets and systems*. (Accepted)

6. Jackson S, Sasikala D, Deepa M, An expert system design to diagnose coronary heart disease using soft sets, *Expert system with applications.* (Communicated)

7. Deepa M, Sasikala D, On disconnected spaces via liberal class of sets, *Southeast Asian Journal of Mathematics and Mathematical sciences.* (Communicated)

ADV MATH
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A NOTE ON CONNECTEDNESS IN TOPOLOGICAL SPACES

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ABSTRACT. In this paper, we introduce two new types of connectedness namely
j-connectedness and $\frac{1}{2}$j-connectedness in a topological space. Also, we discuss
some of their basic properties and analyze the characterization using theorems.

1. INTRODUCTION

Connectedness is one of the most important topological property. In 1975, Pipetone and Russo introduced semiconnectedness [6] in a topological space. Based on the sets of preopen , α open, β open, the concepts of preconnectedness [7], α connectedness [6] and β connectedness [3] were introduced. In 1982, Mashhour et.al [4] introduced preopen sets and pre continuous function in topological space.

In 2005, the concept of (α, β) semi-connectedness [2] was introduced by Ennis Rosas, Carlos Carpintere and Jose Sanabria. In 2015, Tapi, Bhagyashri Deole introduced semiconnectedness and preconnectedness in Biclosure spaces [8]. The new concepts of half b-connectedness in topological space was introduced by T.Noiri and Shyamapada Modak in 2016 [5]. In 2017, Tyagi, Sumit Singh and Manoj Bhardwaj introduced P_β connectedness in topological space [9]. I. Arokiarani and D. Sasikala introduced a new type of set namely j-open sets in 2011, [1].

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An Elementary Approach on Hyperconnected Spaces

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Abstract: This paper aims to establish a new notion of hyperconnected spaces namely semi j hyperconnected spaces by using semi j open sets. The relation between the existing spaces are also discussed. We also investigate some elementary properties of semi j hyperconnected spaces.

Keywords: semi j open set, semi j closed set, semi j regular open, semi j interior, semi j closure

1. Introduction

The notion of hyperconnected space was introduced and studied by many authors[1],[7],[10]. N.Levine[8] introduced D space i.,e every non empty open set of X is dense in X. In 1979, Takashi Noiri[10] initiated the concept of hy- perconnected sets in a topological space by using semi open sets. In 1995, T.Noiri[11] formulated various properties of hyperconnected space using semi pre open sets. In 2011, Bose and Tiwari[6] found ω hyperconnectedness in topological space. In 2015, the concept of S* hyperconnectedness in supra topological spaces was studied by Adithya K.Hussain[1]. In 2016, I.Basdouri, R.Messoud, A.Missaoui[5] discussed about connectedness and hyperconnect- edness in generalised topological space. A.K.Sharma[13] determined that D spaces are equivalent to hyperconnected spaces. Recently, Lellis Thivagar and Geetha Antoinette[7] implemented a new concept of nano hyperconnectedness in 2019.

In 1963, N.Levine[9] investigated semi open sets and semi continuity in topological spaces. In 1986, semi preopen sets was introduced by D.Andrijevic[3]. In 2011, I.Arockiarani and D.Sasikala[4] presented j open sets in generalised topological spaces. D.Sasikala and M.Deepa[12] defined j connectedness and half j connectedness with the help of j open sets in 2020.

In this paper, we introduce semi j open sets in topological space and investigate some of its properties. Also, we define semi j hyperconnected spaces by using semi j open sets and also discussed some of its properties. Throughout this paper, X denotes the topological spaces.

2. Preliminaries

Definition 2.1

A subset A is said to be semi open if there exists an open set U of X such that $U \subset A \subset cl(U)$. The complement of semi open set is called semi closed.

Definition 2.2

The semi closure of A in X is defined by the intersection of all semi closed sets of X containing A. This is denoted by $scl(A)$.

The semi interior of A in X is the union of all semi open sets contained in A and is denoted by $sint(A)$. The family of all semi open set is denoted by $SO(X)$.

Definition 2.3

A subset A of a topological space X is semi preopen if there exist a pre- open set U in X such that $U \subset A \subset cl(U)$. The family of semi preopen sets in X will be denoted by $SPO(X)$.

Definition 2.4

A subset A of a topological space X is called

(i) regular open if $A = int(cl(A))$.

(ii) preopen if $A \subseteq int(cl(A))$.

(iii) α open if $A \subseteq int(cl(int(A)))$.

(iv) j open if $A \subseteq int(pcl(A))$.

The complement of preopen, α open and j open sets are called pre closed, α closed, j closed respectively.

Lemma 2.5

The following properties hold for a topological space (X, τ)

a) $\tau \subset SO(X) \cap PO(X)$.

b) $SO(X) \cup PO(X) \subset SPO(X)$.

Lemma 2.6

Let A be a subset of a topological space X. Then the following properties hold.

a) $scl(A) = A \cup int(cl(A))$.

b) $pcl(A) = A \cup cl(int(A))$.

c) $spcl(A) = A \cup int(cl(int(A)))$.

Definition 2.7

A subset A of a supra topological space (X, S^{*}) is said to be