

TOPOLOGICAL ALGEBRA IN VIRTUE OF PRE-OPEN SETS

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(Dedicated to Professor Maximilian Ganster on the occasion of his retirement)

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Abstract. In this paper, we elucidate the theory of p - topological group and p - topological ring. Also examine its properties with appropriate examples. Besides, we analyze subrings and ideals of p - topological rings. In addition, we evince that closure of a subring in a p - topological ring is a p - topological ring.

1. Introduction

In Mathematics, we classify structures endowed on a set into two kinds namely, algebraic structure and topological structure. A set endowing more than one structure plays a vital role in the literature. Ring, vector space and algebra are sets bestowed with two algebraic structures. In 1926, Lie developed the concept of continuous groups, a group with continuous binary operation. Based on this, notion of Topological Algebra was developed. By generalizing the continuity, some new structures emerged in [1] and coincidence of those structures on finite set is discussed in [3]. The idea of pre - open sets and pre - continuous functions on a topological space was introduced by Mashhour et. al in [6]. By making use of pre - open sets and pre - continuous functions on algebraic structures, we expound p - topological groups and p - topological rings in this paper.

2. Notation and Preliminaries

The notions pre - open, pre - closed sets follows [11] and pre - interior, pre - closure of a set follows denoted by pin and pcl . Let X and Y be topological spaces then $f : X \mapsto Y$ is pre - continuous if and only if the inverse image of an open set is pre - open (respectively, inverse image of a closed set is pre - closed). A subset \mathcal{D} of X is pre - connected [9] if \mathcal{D} cannot be written as the union of two disjoint pre - open sets.

On all accounts of this paper, the pair (G, τ) denotes a group G with topology τ and (\mathcal{R}, τ) betoken a ring \mathcal{R} , with addition $+$ and multiplication \cdot in conjunction with

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