

Distributive Lattices of λ -simple Semirings

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ABSTRACT. In this paper, we study the decomposition of semirings with a semilattice additive reduct. For, we introduce the notion of principal left k -radicals $\Lambda(a) = \{x \in S \mid a \xrightarrow{l}^{\infty} x\}$ induced by the transitive closure \xrightarrow{l}^{∞} of the relation \xrightarrow{l} which induce the equivalence relation λ . Again non-transitivity of \xrightarrow{l} yields an expanding family $\{\xrightarrow{l}^n\}$ of binary relations which associate subsets $\Lambda_n(a)$ for all $a \in S$, which again induces an equivalence relation λ_n . We also define $\lambda(\lambda_n)$ -simple semirings, and characterize the semirings which are distributive lattices of $\lambda(\lambda_n)$ -simple semirings.

Keywords: Principal left k -radical, Distributive lattice congruence, Completely semiprime k -ideal, λ -simple semiring, Distributive lattice decomposition.

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1. INTRODUCTION

The notion of semirings was introduced by Vandiver [12]. Semiring is a generalization of both an associative ring as well as of distributive lattices. Since semiring is a $(2, 2)$ algebra, it has many applications in different areas of

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