On LA-Semimodule Over LA-Semiring

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Abstract

In this paper, we develop an LA-module over LA-ring to a new concept namely LA-semimodule over LA-semiring. Let S be a non-empty set with two binary operations "$+$" and "$*$". Set S is called a left almost semiring (LA-semiring) if $(S, +)$ is an LA-semigroup, $(S, *)$ is an LA-semigroup and satisfying left and right distributive law of "$*$" over "$+$" hold. Let $(S, +, *)$ is an LA-semiring with left additive identity equal to 0_S and left multiplicative identity equal to 1, non-empty set M is called an LA-semimodule over S if 1) $(M, +)$ is an LA-semigroup with left identity, 2) the map $S \times M \to M$, $(s, m) \mapsto sm$ where $s \in S$ and $m \in M$ satisfies i) $s(m + n) = sm + sn$, ii) $(r + s)m = rm + sm$, iii) $r(sm) = s(rm)$, iv) $1 * m = m$, for all $r, s \in R$, and $m, n \in M$. Then, we investigate the basic properties and the Isomorphims Theorem for LA-semimodule over LA-semiring.

Keywords: LA-semigroup; LA-semiring; LA-semimodule.