COMMUNICATIONS IN ALGEBRA®
2019, VOL. 47, NO. 5, 1954–1963
https://doi.org/10.1080/00927872.2018.1524011

Taylor & Francis
Taylor & Francis Group

Check for updates

On additively completely regular seminearrings: II

Rajlaxmi Mukherjee[a], Pavel Pal[b], Tuhin Manna[c], and Sujit Kumar Sardar[c]

[a]Department of Mathematics, Garhbeta College, Paschim Medinipur, India; [b]Department of Mathematics, Bankura University, Bankura, India; [c]Department of Mathematics, Jadavpur University, Kolkata, India

ABSTRACT

As a continuation of our previous work, an attempt has been made to obtain some sort of analog of structure theorem of Clifford semigroups in the setting of seminearrings. To accomplish this, the notion of strong bi-semilattice of seminearrings has been introduced. Then those left (right) Clifford seminearrings, which are strong bi-semilattice of near-rings (zero-symmetric near-rings) and strong distributive lattice of near-rings (zero-symmetric near-rings) have been characterized.

ARTICLE HISTORY
Received 3 April 2018
Revised 23 August 2018
Communicated by
V. A. Artamonov

KEYWORDS
E^+-unitary seminearring; strong bi-semilattice of (zero-symmetric) near-rings; strong distributive lattice of (zero-symmetric) near-rings

2010 MATHEMATICS SUBJECT CLASSIFICATION
16Y30; 16Y60; 16Y99

1. Introduction

Seminearring is a natural generalization of semiring as well as of near-ring. A semiring without one distributive property becomes a seminearring and a near-ring without the existence of additive inverse becomes a seminearring. Following Weinert [13], we call $(S,+,\cdot)$ a seminearring if (1) $(S,+)$ is a semigroup (not necessarily commutative), (2) $(S,\cdot)$ is a semigroup (not necessarily commutative), (3) $(a+b)\cdot c = a\cdot c + b\cdot c$ for all $a,\ b,\ c \in S$ ("right distributive law"). A (right) seminearrings $(S,+,\cdot)$ is said to be with zero if 0 is the additive identity of S and 0 satisfies the property $0\cdot a = 0$. A seminearring S is said to be *zero-symmetric* if S is a seminearring with 0 in which $s\cdot 0 = 0$ for each $s \in S$. The seminearring considered in [3] was zero-symmetric. But throughout this article, unless mentioned otherwise, the seminearring need not have to be with zero. Though the theory of seminearrings has not been as developed as that of semirings but it has a sustained research interest which is evident from good many publications such as [1–6,9–11,13–15].

It may be mentioned here that the algebra of seminearrings underlies one approach to process algebra in the Bergstra–Klop axiomatization of the algebra of communicating process. Seminearrings have also been considered in the context of reversible computation.

Semirings occur naturally as the (semigroup) endomorphisms of additively commutative semigroups and near-rings occur naturally as the set of all self-maps of additive groups. In a similar way, seminearrings occur naturally as $M(S)$, the set of all self-maps of an additive semigroup S. Though the natural seminearring, $M(S)$ is not additively regular for an arbitrary additive

CONTACT Sujit Kumar Sardar sksardarjumath@gmail.com Department of Mathematics, Jadavpur University, Kolkata 700032, India.