

**NATIONAL SYMPOSIUM ON
MATHEMATICAL METHODS AND APPLICATIONS**

22nd December 2003

Indian Institute of Technology, Madras
Chennai, TN
India

S- ELEMENTS IN NON-ASSOCIATIVE RINGS

W.B. Vasantha Kandasamy and Virgin Raj

In this paper we introduce the notion of S-zero divisors, S-units, S-nilpotents, S-idempotents, S-normal elements, S-semi idempotents, S-quasi regular elements in a non-associative ring which we take mainly as a loop ring. We prove let $Z_p = \{0, 1, \dots, p - 1\}$ be the prime field of characteristic p ($p > 2$), $L_n(m)$ be the loop where we choose $n = p$. Then

$$\alpha = 1 + g_1 + \dots + g_n$$

and

$$\beta = \left(\frac{p+1}{2} + \frac{p+1}{2} g_i \right),$$

$g_i \in L_p(m)$ are S-idempotents of the loop ring $Z_p L_p(m)$ for any loop $L_p(m) \in L_p$. Let $Z_2 = \{0, 1\}$ be the prime field of characteristic two and $L_n(m) \in L_n$ be the class of loops. Then all elements of the form $x = 1 + g_i \in Z_2 L_n(m)$ where $g_i \in L_n(m)$ are S-pseudo zero divisors of $Z_2 L_n(m)$.

All Rights Reserved. This work is Copyright © W.B.Vasantha Kandasamy and Virgin Raj, 2003. Mathematicians can use the above material for research purposes, but the work of the author(s) ***must*** be acknowledged. Violators of copyright, and those indulging in *plagiarism* and *intellectual theft* are liable for strict prosecution.

e-mail: vasantha@iitm.ac.in

web: www.vasanthakandasamy.org