β_3 near - ring

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Abstract

In this paper, we introduce β_3 near - rings and give some examples. By some examples and theorems, we find relations between β_3 near - rings, β_1 near - rings and strong B_1 near - rings. Finally, we show that every β_3 near - ring N is isomorphic to a subdirect product of subdirectly irreducible β_3 near - rings.

Keywords: β_1 near - ring, β_3 near - ring, strong B_1 near - ring, mate function
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1 Introduction and preliminaries

near - rings were introduce by Dickson in 1905 and we proved some theorems. Then B_1 near - rings and strong B_1 near - ring were defined by S.Silviya, and etal [4]. After that U.Sugantha and R.Balakrishnan defined β_1 near - rings and investigated the relation between these notions and (strong) B_1 near - rings [5].
In this paper, we defined β_3 near - rings and find some relations between β_3 near - rings, β_1 near - rings and strong B_1 near - rings.
At first we recall the definition a near - ring.

Definition 1.1. [3] A near - ring is a non - empty set N together with two binary operations "+" and "." such that
(a) (N , +) is a group (not necessarily ablian),
(b) (N , .) is a semigroup,
(c) $\forall n_1, n_2\ n_3 \in N$: $(n_1 + n_2)n_3 = n_1n_3 + n_2n_3$ (" right distributive law ")
Obviously $0n = 0$ for all $n \in N$. If, in addition, $n0 = 0$ for all $n \in N$, we say that N is zero symmetric.
In a near - ring N, and $\phi \neq S \subseteq N$, we denote:

$$L = \{a \in N \mid \exists n \in \mathbb{N}\ s.t\ a^n = 0\}$$

$$E = \{a \in N \mid a^2 = a\}$$

$$C(S) = \{n \in N \mid nx = xn; \forall x \in N\}$$

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