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STRUCTURE OF PERIODIC RINGS AND CERTAIN NEARRINGS

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Abstract: In the present paper, we first establish, in Section 2, some decomposition theorems for rings and its subsets (see Theorem 2.1 and Theorem 2.2, for details). Secondly, in Section 3, certain nearrings satisfying one of the defined properties (C) to (C_5), under appropriate conditions such nearrings are in fact shown to be commutative. Thirdly, in Section 4, it is proved that any nearring is decomposable into a direct sum of special sub nearrings and the Pierce-decomposition for rings is generalized. Finally, in Section 5, we provide some counterexamples which show that hypotheses of our theorems are not altogether superfluous.

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Key Words: decomposition theorem, J-ring, nil ring, periodic nearring, zero-commutative, distributively-generated (d − g) nearing, D-nearring

1. Introduction

Throughout, in Section 2, R will represent an associative ring (may be without unity 1) and N the set of nilpotent elements of R. The symbol Z will denote the ring of integers, Z[X] the ring of polynomials in one indeterminate with integer coefficients.

Recall: The concept of Boolean ring, as a ring in which every element is idempotent, was first introduced by Stone [27]. With this as motivation, McCoy and Montgomery [21] introduced the concept of p-ring (p prime) as a ring R

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