

عنوان مقاله:

Non-reduced rings of small order and their maximal graph

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خلاصه مقاله:

Let  $R$  be a commutative ring with nonzero identity. Let  $\Gamma(R)$  denotes the maximal graph corresponding to the non-unit elements of  $R$ , that is,  $\Gamma(R)$  is a graph with vertices the non-unit elements of  $R$ , where two distinct vertices  $a$  and  $b$  are adjacent if and only if there is a maximal ideal of  $R$  containing both. In this paper, we investigate that for a given positive integer  $n$ , is there a non-reduced ring  $R$  with  $n$  non-units? For  $n \leq 10$ , a complete list of non-reduced decomposable rings  $R = \prod_{i=1}^k R_i$  (up to cardinalities of constituent local rings  $R_i$ 's) with  $n$  non-units is given. We also show that for which  $n$ ,  $(1 \leq n \leq 15)$ ,  $|\text{Center}(\Gamma(R))|$  attains the bounds in the inequality  $1 \leq |\text{Center}(\Gamma(R))| \leq n$  and for which  $n$ ,  $(2 \leq n \leq 10)$ ,  $|\text{Center}(\Gamma(R))|$  attains the value between the bounds

کلمات کلیدی:

Non-reduced ring, Jacobson radical, maximal graphs, center, median

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