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# $g(x)$-NIL CLEAN RINGS

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ABSTRACT. An element in a ring $R$ with identity is called nil clean if it is the sum of an idempotent and a nilpotent, $R$ is called nil clean if every element of $R$ is nil clean. Let $C(R)$ be the center of a ring $R$ and $g(x)$ be a fixed polynomial in $C(R)[x]$. Then $R$ is called $g(x)$-nil clean if every element in $R$ is a sum of a nilpotent and a root of $g(x)$. In this paper, we investigate many properties and examples of $g(x)$-nil clean rings. Moreover, we characterize nil clean rings as $g(x)$-nil clean rings where $g(x) \in (x-(a+1))(x-b)C(R)[x]$, $a, b \in C(R)$ and $b - a \in N(R)$.

*Key words and phrases.* clean ring, $g(x)$-clean ring, nil clean ring, $g(x)$-nil clean ring.