POSITIVELY GRADED RINGS ARE MAXIMAL ORDERS AND GENERALIZED DEDEKIND RINGS

Sutopo[1], Indah Emilia Wijayantin[2], Hidestoshi Marubayashi[3]

[1,2]Department of Mathematics, Universitas Gadjah Mada
Yogyakarta, Indonesia
[3]Naruto University of Education, Japan

Email: sutopo_mipa@ugm.ac.id, ind_wijayanti@ugm.ac.id, marubaya@naruto-u.ac.jp

Let $R = \oplus_{n\in\mathbb{Z}_0} R_n$ be a positively graded ring which is a sub-ring of strongly graded ring of type $\mathbb{Z}$, where R_0 is a Noetherian prime rings. We define a concept of $\mathbb{Z}_0-$invariant maximal order and show that R is a maximal order if and only if R_0 is a $\mathbb{Z}_0-$invariant maximal order. If R is a maximal order, then we completely describe all $v-$invertible ideals. As an application, we show that R is a generalized Dedekind prime if and anly if R_0 is a $\mathbb{Z}_0-$invariant generalized Dedekind prime rings. We give example of $\mathbb{Z}_0-$invariant generalized Dedekind prime rings but neither generalized Dedekind prime rings nor maximal orders.

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