Title:	When is R[θ] integrally closed?
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Abstract:	Let R be an integrally closed domain with quotient field K and θ be an element of an integral domain containing R with θ integral over R. Let F(x) be the minimal polynomial of θ over K and p be a maximal ideal of R. Kummer proved that if R[θ] is an integrally closed domain, then the maximal ideals of R[θ] which lie over p can be explicitly determined from the irreducible factors of F(x) modulo p. In 1878, Dedekind gave a criterion known as Dedekind Criterion to be satisfied by F(x) for R[θ] to be integrally closed in case R is the localization Z(p) of Z at a nonzero prime ideal pZ of Z. Indeed he proved that if g1(x)e1···gr(x)er is the factorization of F(x) into irreducible polynomials modulo p with gi(x)∈Z[x] monic, then Z(p)[θ] is integrally closed if and only if for each i, either ei=1 or gi(x) does not divide H(x) modulo p, where H(x)=1p(F(x)−g1(x)e1···gr(x)er). In 2006, a similar necessary and sufficient condition was given by Ershov for R[θ] to be integrally closed when R is the valuation ring of a Krull valuation of arbitrary rank (see [Comm. Algebra.38 (2010) 684–696]). In this paper, we deal with the above problem for more general rings besides giving some equivalent versions of Dedekind Criterion. The well-known result of Uchida in this direction proved for Dedekind domains has also been deduced (cf. [Osaka J. Math.14 (1977) 155–157]).
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