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Title:	On the index theorem of Ore
Authors:	Jhorar, B. (/jspui/browse?type=author&value=Jhorar%2C+B.) Khanduja, S.K. (/jspui/browse?type=author&value=Khanduja%2C+S.K.)
Keywords:	12E05 12J10 12J25
Issue Date:	2017
Publisher:	Springer New York LLC
Citation:	Manuscripta Mathematica, 153
Abstract:	Let $K = \mathbb{Q}(\theta)$ be an algebraic number field with θ in the ring A_K of algebraic integers of K and $F(x)$ be the minimal polynomial of θ over the field \mathbb{Q} of rational numbers. For a rational prime p , let $F(x) \equiv \phi_1(x) \dots \phi_r(x) \pmod{p}$ be its factorization into a product of powers of distinct irreducible polynomials modulo p with $\phi_i(x) \in \mathbb{Z}[x]$ monic. Let $i_p(F)$ denote the highest power of p dividing $[A_K : \mathbb{Z}[\theta]]$ and $i_{\phi_j}(F)$ denote the ϕ_j -index of F defined by $i_{\phi_j}(F) = (\deg \phi_j) N_j$, where N_j is the number of points with integral entries lying on or below the ϕ_j -Newton polygon of F away from the axes as well as from the vertical line passing through the last vertex of this polygon. The Theorem of Index of Ore states that $i_p(F) \geq \sum_{j=1}^r i_{\phi_j}(F)$ and equality holds if $F(x)$ satisfies a certain condition called p -regularity. In this paper, we extend the above theorem to irreducible polynomials with coefficients from valued fields of arbitrary rank and give a necessary and sufficient condition so that equality holds in the analogous inequality thereby generalizing similar results for discrete valued fields obtained in Montes and Nart (J Algebra 146:318–334, 1992) and Khanduja and Kumar (J Pure Appl Algebra 218:1206–1218, 2014). The introduction of the notion of ϕ_j -index of F in the general case involves some new results which are of independent interest as well. © 2016, Springer-Verlag Berlin Heidelberg.
URI:	https://www.infona.pl/resource/bwmeta1.element.springer-doi-10_1007-S00229-016-0879-2 (https://www.infona.pl/resource/bwmeta1.element.springer-doi-10_1007-S00229-016-0879-2) http://hdl.handle.net/123456789/2565 (http://hdl.handle.net/123456789/2565)
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