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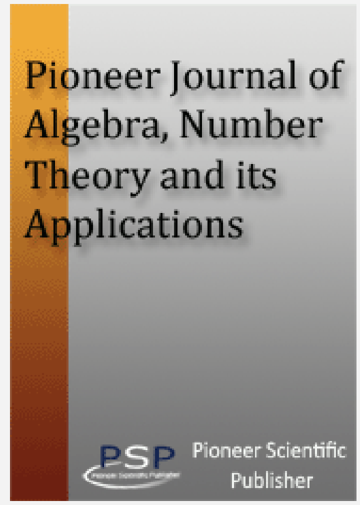

SOME ASPECTS OF GENERALIZED SAMUEL NUMBERS AND QUASI-GRADUATIONS ON A SEMI-RING

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Abstract

The asymptotic theory of ideal originated with the investigation in a noetherian ring A of the Samuel number $\bar{v}_I(J)$ associated with each pair (I, J) of non-nilpotents ideals having the same radical and

$$\bar{v}_I(J) = \lim_{n \to +\infty} \frac{v_I(J^n)}{n}$$

the limit being reached from below and $v_I(J) = \sup\{r \in \mathbb{N}/J \subset I^r\}$.

In this paper, we give some aspects of generalized Samuel numbers $\tilde{t}_h(g)$, where $h = (H_n)_{n \in \mathbb{N}}$ is a quasi-graduation of sub-monoids on a semi-ring A and $g = (J_n)_{n \in \mathbb{N}}$ is a filtration of sub-monoids on A. It is shown that

1. $\lim_{k \to +\infty} \frac{\tilde{t}_h(J_k)}{k}$ exists in $\overline{\mathbb{R}}$ and we have

$$\overline{\lim} \frac{t_h(J_n)}{n} \leq \lim_{k \to +\infty} \frac{\tilde{t}_h(J_k)}{k}.$$

2. If $g = (J_n)_{n \in \mathbb{N}}$ is an AP-filtration on A such that $J_0 \subset H_0$, then $\tilde{t}_h(g)$ exists in $\overline{\mathbb{R}}$ and we have $\tilde{t}_h(g) = \lim_{n \to +\infty} \frac{\tilde{t}_h(J_n)}{n}$.

Keywords and phrases: semi-ring, quasi-graduation, filtration, pseudo-valuation.