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On bi-ideals of ordered Γ- semigroups – A Corrigendum

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This is a Corrigendum of the paper in [1]. We keep the numbering given in [1] and we add our remarks and corrections.

We give, among others, the correct definition of a strongly regular *po*-Γ-semigroup, and we correct the proof of 2.19 Lemma given in [1]. As one can see below, each of the papers in the References of the present paper contains its corresponding result in [1] and only such papers are cited in the References of this corrigendum and nothing more.

1.1 Definition Adding the uniqueness condition in the definition given by Sen and Saha in [12], we get the 1.1 Definition in [1] first introduced in [5] (cf. also [6,7]) which, for an ordered Γ-semigroup M, allows us in an expression of the form, say $A_1\Gamma A_2\Gamma, ..., A_n\Gamma$ to put the parentheses anywhere beginning with some A_i and ending in some A_j $(i, j \in N = \{1, 2, ..., n\})$ or in an expression of the form $a_1\Gamma a_2\Gamma, ..., a_n\Gamma$ or $a_1\gamma a_2\gamma, ..., a_n\gamma$ to put the parentheses anywhere beginning with some a_i and ending in some a_j ($A_1, A_2, ..., A_n$ being subsets and $a_1, a_2, ..., a_n$ elements of M). Unless the uniqueness condition (widely used by some authors in the past), in an expression of the form, say $a\gamma b\mu c\xi d\rho e$ or $a\Gamma b\Gamma c\Gamma d\Gamma e$, it was not known where to put the parentheses. As the sets M and Γ are different, in the property (1) of that Definition in [1] we have to express what the $a\gamma b \in M$ $(a, b \in M,\ \gamma \in \Gamma)$ means. So in the 1.1 Definition in [1] we add the following: For two nonempty sets M and Γ, define $M\Gamma M$ as the set of all elements of the form $m_1\gamma m_2$, where $m_1, m_2 \in M$, $\gamma \in \Gamma$. That is,

$M\Gamma M := \{m_1\gamma m_2 \mid m_1, m_2 \in M, \gamma \in \Gamma\}$.

Let now M and Γ be two nonempty sets. The set M is called a Γ-semigroup if the following assertions are satisfied:

(1) $M\Gamma M \subseteq M$.

(2) If $m_1, m_2, m_3, m_4 \in M$, $\gamma_1, \gamma_2 \in \Gamma$ such that $m_1 = m_3$, $\gamma_1 = \gamma_2$ and $m_2 = m_4$, then $m_1\gamma_1 m_2 = m_3\gamma_2 m_4$.

(3) $(m_1\gamma_1 m_2)\gamma_2 m_3 = m_1\gamma_1(m_2\gamma_2 m_3)$ for all $m_1, m_2, m_3 \in M$ and all $\gamma_1, \gamma_2 \in \Gamma$.

After the definition of ideals, on p. 794, lines –12 till –15, the authors wrote: "It is clear that the intersection of all ideals of a *po*-Γ-semigroup M is still an ideal of M" which is not true in general. The intersection of ideals is an ideal only if their intersection is nonempty. Then they say "We shall call this particular ideal, if exists, the kernel of M". But it is clear that such an intersection always exists. If there is no any proper ideal in M, then M itself is an ideal of M.

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