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CORRIGENDUM TO "THE IDEAL THEORY IN QUOTIENTS OF COMMUTATIVE SEMIRINGS"

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Abstract. This corrigendum is written to correct an error in the proof of the Theorem 2.16 of S. E. Atani [1].

The subject of this paper is to correct Theorem 2.16 of [1]. It reads as follows.

Theorem. *Let I be a Q-ideal of a semiring R. Then the following hold:*

(i) *if both I and R/I are Noetherian, then R is Noetherian,*
(ii) *if both I and R/I are Artinian, then R is Artinian.*

In the proof of this theorem in [1] it was used that the sum $I + J$ of two k-ideals I (note that any Q-ideal is a k-ideal, but not conversely) and J of R is again a k-ideal. Since it is well known that this is not true in general, this theorem is not true either. But in the two following special cases, the proof and the theorem (under each of these additional assumptions) remain valid.

a) R is a *k-semiring*, i.e. every ideal of R is a k-ideal.
b) I is a *strong k-ideal* of R, i.e. for every $a \in I$ there is some $b \in I$ such that $a + b = 0$.

Since case a) is obvious, it is sufficient to show that in case b) the sum $I + J$ for every k-ideal J of R is also a k-ideal. But if $a+j, a+j+x = a'+j' \in I+J$ for $a, a' \in I$, $j, j' \in J$ and $x \in R$, there is some $b' \in I$ such that $a' + b' = 0$, since I is strong. This implies $j' = a' + b' + j' = a + b' + j + x \in J$, hence $a + b' + x \in J$, since J is a k-ideal of R. Now, since $a + b' \in I$, there is some $c \in I$ such that $a + b' + c = 0$. Therefore $x = c + a + b' + x \in I + J$, and so $I + J$ is a k-ideal of R.

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Clearly, Lemma 2.12 (i) and Lemma 2.13 (i) in [1] have to be deleted.

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References

[1] S. Ebrahimi Atani *The ideal theory in the quotients of semirings,* Glas. Mat. Ser. III **42(62)** (2007), 301–308.

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