On Fuzzy Ideals Of Subtraction Semigroups

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Abstract: In this paper, we introduce the notion of fuzzy interior ideal, fuzzy bi-ideal, intuitionistic fuzzy interior ideal and intuitionistic fuzzy bi-ideal of a subtraction semigroup. We characterize a non-empty subset of a subtraction semigroup X through intuitionistic fuzzy ideal, intuitionistic fuzzy bi-ideal and intuitionistic fuzzy interior ideal. We give some equivalent conditions related to these notions.

Key words: Subtraction semigroups, fuzzy interior ideal, fuzzy bi-ideal, intuitionistic fuzzy interior ideal, intuitionistic fuzzy bi-ideal.

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1. Introduction and Preliminaries

B. M. Schein ([11]) considered systems of the form (Φ; ∘, \), where Φ is a set of functions closed under the composition "∘" of functions (and hence (Φ; ∘) is a function semigroup) and the set theoretic subtraction "\" (and hence (Φ; \) is a subtraction algebra in the sense of [3]). He proved that every subtraction semigroup is isomorphic to a difference semigroup of invertible functions. B. Zelinka ([14]) discussed a problem proposed by B. M. Schein concerning the structure of multiplication in a subtraction semigroup. He solved the problem for subtraction algebras of a special type, called the atomic subtraction algebras. Y. B. Jun, H. S. Kim and E. H. Roh ([6]) introduced the notion of ideals in subtraction algebras and discussed characterizations of ideals. In [7], Y. B. Jun and H. S. Kim established the ideal generated by a set and discussed related results.

After the introduction of fuzzy sets by Zadeh ([13]), several researchers were conducted on the generalizations of the notion of fuzzy set. The concept of intuitionistic fuzzy set was introduced by Atanassov [1,2] as a generalization of the notion of fuzzy set. In [12], Williams introduce a notion of fuzzy ideals in near-subtraction semigroups, and studied their related properties. In [5], Dheena and Mohanraj introduced the notion of fuzzy ideal, fuzzy weak ideal, fuzzy weakly prime left ideal and fuzzy prime left ideal system of a near-subtraction semigroup and discussed some related results.