FUZZY BI-Γ-IDEALS IN Γ-SEMIGROUPS

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Abstract

In this paper, we consider the fuzzification of bi-Γ-ideals in Γ-semigroups, and investigate some of their related properties. Maximal fuzzy bi-Γ-ideals of Γ-semigroups are introduced and their properties discussed. Finally, chain conditions relating to fuzzy bi-Γ-ideals of Γ-semigroups are investigated.

Keywords: Γ-semigroups, Fuzzy Γ-ideals, Fuzzy bi-Γ-ideals, Fuzzy interior Γ-ideals.


1. Introduction

Following the introduction of fuzzy sets by Zadeh [25], the fuzzy set theories developed by Zadeh and others have found many applications in the domain of mathematics and elsewhere.

The study of fuzzy algebraic structures started with the introduction of the concepts of fuzzy subgroup (subgroupoid) and fuzzy (left, right) ideal in the pioneering paper of Rosenfeld [18]. In 1979, Anthony and Sherwood [1] redefined fuzzy subgroups (subgroupoids) using the concept of triangular norm. Das [6] defined level subgroups and used them to study fuzzy groups. Liu [13] introduced such concepts as fuzzy invariant subgroups, fuzzy ideals and in particular, gave a characteristic of a (usual) field by a fuzzy ideal. Mukerjee et.al [15] also worked on characterizing fuzzy subgroups of various groups. Kuroki [10, 11] introduced and studied fuzzy (left, right) ideals and fuzzy bi-ideals in semigroups. Later some basic concepts of fuzzy algebra such as fuzzy (left, right) ideals and fuzzy bi-ideals in a fuzzy semigroup, using a new approach of fuzzy spaces and fuzzy groups was introduced by Dib [7] in 1994.

In [16], Nobusawa introduced the notion of a Γ-ring as a generalization of a ring. Barnes [2] weakened slightly the conditions in the definition of a Γ-ring in the sense of

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