

ON FUZZY HYPERIDEALS OF Γ -HYPERRINGS

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ABSTRACT. The aim of this paper is the study of fuzzy Γ -hyperrings. In this regard the notion of ν -fuzzy hyperideals of Γ -hyperrings are introduced and basic properties of them are investigated. In particular, the representation theorem for ν -fuzzy hyperideals are given and it is shown that the image of a ν -fuzzy hyperideal of a Γ -hyperring under a certain conditions is two-valued. Finally, the product of ν -fuzzy hyperideals are studied.

1. Introduction

Hyperstructure theory was born in 1934 when Marty defined hypergroups, began to analysis their properties and applied them to groups, rational algebraic functions [16]. Now they are widely studied from theoretical point of view and for their applications to many subjects of pure and applied properties and applied mathematics (for example see [5], [6], [22]).

Also, following the introduction of fuzzy sets by L. A. Zadeh in 1965 [23], the fuzzy set theory were developed by Zadeh himself and many researchers in mathematics and it was applied in many pure and applied areas. For example the concept of a fuzzy group was introduced by A. Rosenfeld and the notion of fuzzy ideal in a ring introduced and studied by W. J. Liu [15]. Recently fuzzy set theory have been had good develop in hyperstructures theory (for example see [7], [8], [9], [10], [11],[24]).

The notion of Γ -rings introduced by N. Nobosawa in [19] and immediately after him in 1966, Barnes extended this notion and obtained more results [4]. Kyuno investigated the new aspects of Γ -rings such as, prime Γ -rings and left and right unities of Γ -rings. Also in recent years Ozturk, Y. B. Jun and C. Y. Lee in [12] and [20] applied the concept of fuzzy sets to the theory of Γ -rings.

In this paper, first we introduce the notion of (ν -)fuzzy hyperideals of Γ -hyperrings and, then we obtain some related basic results. We characterize (ν -)fuzzy hyperideals based on their level subsets and associate a new (ν -fuzzy) hyperideal from a given fuzzy hyperideal of a Γ -hyperring. In particular, we show that under certain conditions ν -fuzzy hyperideals of Γ -hyperrings are two-valued. Finally we describe ν -fuzzy hyperideals of product of Γ -hyperrings.

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