

Ordered semigroups characterized by (is an element of, is an element of boolean OR $q(k)$)-fuzzy generalized bi-ideals

Abstract:

In this paper, we introduce a considerable machinery that permits us to characterize a number of special (fuzzy) subsets in ordered semigroups. In this regard, we generalize (Davvaz and Khan in Inform Sci 181:1759-1770 2011) and define (is an element of, is an element of boolean OR $q(k)$)-fuzzy generalized bi-ideals in ordered semigroups, which is a generalization of the concept of an (α, β) -fuzzy generalized bi-ideal in an ordered semi-group. We also define (is an element of, is an element of boolean OR $q(k)$)-fuzzy left (resp. right)ideals. Using these concept, some characterization theorems of regular, left (resp. right) regular, completely regular and weakly regular ordered semigroups are provided. The upper/lower parts of an (is an element of, is an element of boolean OR $q(k)$)-fuzzy generalized bi-ideal and (is an element of, is an element of boolean OR $q(k)$)-fuzzy left (resp. right)-ideal are given, and some characterizations are provided.