Derivation of BCK\BCI-Algebras

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Abstract : The concept of this paper builds on connecting between two important notions, fuzzy ideals of BCK-algebras and derivation of BCI-algebras. The result we got is a new concept called derivation fuzzy ideals of BCI-algebras. Followed by various results and important theorems on different types of ideals. In chapter 1: We presented the basic and fundamental concepts of BCK\ BCI- algebras as follows: BCK/BCI-algebras, BCK sub-algebras, bounded BCK-algebras, positive implicative BCK-algebras, commutative BCK-algebras, implicative BCK- algebras. Moreover, we discussed ideals of BCK-algebras, positive implicative ideals, implicative ideals and commutative ideals. In the last section of chapter 1 we proposed the notion of derivation of BCI-algebras, regular derivation of BCI-algebras and basic definitions and properties. In chapter 2: It includes 3 sections as follows: Section 1 contains elementary concepts of fuzzy sets and fuzzy set operations. Section 2 shows O. G. Xi idea, where he applies fuzzy sets concept to BCK-algebras and we studied fuzzy sub-algebras as well. Section 3 contains fuzzy ideals of BCK-algebras basic definitions, closed fuzzy ideals, fuzzy commutative ideals, fuzzy positive implicative ideals, fuzzy implicative ideals, fuzzy H-ideals and fuzzy p-ideals. Moreover, we investigated their concepts in diverse theorems and propositions. In chapter 3: The main concept of our thesis on derivation fuzzy ideals of BCI- algebras is introduced. Chapter 3 splits into 4 sections. We start with General definitions and important theorems on derivation fuzzy ideal theory in section 1. Section 2 and 3 contain derivations fuzzy p-ideals and derivations fuzzy H-ideals of BCI- algebras, several important theorems and propositions were introduced. The last section studied derivations fuzzy implicative ideals of BCI-algebras and it includes new theorems and results. Furthermore, we presented a new theorem that associate derivations fuzzy implicative ideals, derivations fuzzy positive implicative ideals and derivations fuzzy commutative ideals. These concepts and the new results were obtained and introduced in chapter 3 were submitted in two separated articles and accepted for publication.

Keywords : BCK, BCI, algebras, derivation

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