

## Abstract

In this thesis, we initiate the notions of  $(\alpha, \beta)$ -fuzzy ideal and  $(\alpha, \beta)$ -fuzzy F-ideal in a QS-algebra and investigate some of their properties, where  $\alpha, \beta$  are any one of  $\in, q_k, \in \vee q_k, \in \wedge q_k$  unless otherwise specified. We also define the concept of  $(\in, \in \vee q_k)$ -fuzzy F-ideal in a QS-algebra. The concepts of implication-based fuzzy F-ideal and implication operators in Lukasiewicz system of continuous-valued logic in QS-algebra are introduced. Finally, we define the concept of  $(\bar{\alpha}, \bar{\beta})$ -fuzzy F-ideals in a QS-algebra, where  $\bar{\alpha}, \bar{\beta}$  are any one of  $\bar{\in}, \bar{q}_k, \bar{\in} \vee \bar{q}_k, \bar{\in} \wedge \bar{q}_k$  and investigate some of their related properties.