PREFACE

In 1965, Zadeh L.A.[61] introduced the notion of a fuzzy subset of a set as a method for representing uncertainty. His ideas have been applied to a wide range of scientific areas. In 1971, Rosenfeld[42] defined fuzzy sub groups. Fuzzy automata were first introduced by Wee W.G.[55] in 1976. In 1982, Holcombe W.M.L.[16] provided a theoretical framework for the more detailed analysis of the applications of machines theory with the ultimate aim of explaining many artificial phenomena. John N. Mordeson et.al[25] in 2002, worked in the area of algebraic fuzzy automata theory. The present study is a continuation of their work. This work expounds how fuzzy subsemiautomata, fuzzy kernel, can be studied with different concepts like triangular norms and thresholds.

Chapter 1 is a discussion of the meaning and significance of the emergence of fuzzy set, fuzzy automata theory and its applications in many real world problems.

Chapter 2 deals with the elementary concepts of fuzzy sets, automata theory, abstract algebra and language theory. Here, Fuzzy finite state machines and its algebraic properties are explained in detail. The structure of fuzzy finite state machines is yet another aspect which is dealt with.

Chapter 3 studies the predominance of T-Fuzzy semiautomata over finite groups. Special attention is given to T- Fuzzy subsemiautomata and T-Fuzzy kernel. Some results concerning these concepts are proved here.
Chapter 4 presents the results of fuzzy subsemiautomata with thresholds and fuzzy kernel with thresholds. Here, some results have been established using strong homomorphism. This chapter concludes with a presentation of some results of multiplicative semiautomaton with thresholds.

Chapter 5 introduces T- fuzzy subsemiautomata with thresholds and T- fuzzy kernel with thresholds using the definition of T- fuzzy subgroup with thresholds.