INTRODUCTION

The theory of rings has long been studied. The multiplicative structure of any ring is by definition a semigroup. The study of semigroups admitting ring structure has drawn considerable attention in the area of semigroups (e.g.,[1],[2],[3],[4]). Semigroups of certain types which admit a ring structure were characterized. Characterization of groups of certain types which admit a ring structure was given. In fact, the study of abelian groups admitting ring stucture is that of abelian groups admitting field structure, and the study of groups admitting ring structure is that of groups admitting skew-field structure. Semifields are a generalization of fields. The theory of semifields was studied in [5]. Groups that admit a structure of semifields is likely to be studied. Groups admitting semifield structure must be abelian. Skew-semifields are defined naturally in order to generalize semifields, that is, a multiplicatively commutative skew-semifield is a semifield and conversely. An example of a skew-semifield which is neither a semifield nor a skew-field is as follows : Let n be a positive integer such that $n \geq 2$. Then under usual addition and multiplication of matrices, the set of all $n \times n$ matrices over $\mathbb{R}$ of the form

$$
\begin{bmatrix}
a_1 & 0 & 0 & 0 & \ldots & b \\
0 & a_2 & 0 & 0 & \ldots & 0 \\
0 & 0 & a_3 & 0 & \ldots & 0 \\
\cdot & \cdot & \cdot & \cdot & \ldots & \cdot \\
0 & 0 & 0 & 0 & \ldots & a_n
\end{bmatrix}
$$

where $a_1, a_2, \ldots, a_n > 0$, including the $n \times n$ zero matrix over $\mathbb{R}$ is a skew-semifield which is neither a semifield nor a skew-field.

The purpose of this research is to study groups which admit a skew-semifield structure. Matrix groups and permutation groups are considered important in the theory of groups. Matrix groups, quotient groups of matrix groups, permutation groups and quotient groups of permutation groups of certain types which admit a skew-semifield structure are characterized.

The preliminaries and notation for this work are given in Chapter I. General properties of skew-semifields are given in Chapter II. Also, in Chapter II, cyclic groups admitting semifield structure are characterized.

Chapter III and Chapter IV are the main results of the thesis. In Chapter III, we characterize various well-known matrix groups and quotient groups of matrix groups which admit the structure of skew-semifields. We characterize well-known permutation groups and quotient groups of permutation groups which admit a skew-semifield structure in Chapter IV.