



Faculty of Science  
Department of Mathematics

# **Study The Effect Of Certain Kinds Of Mappings On The Rings**

A Thesis

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for the Degree of Master of Science

In

**Pure Mathematics**

**(Algebra)**

By

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B. Sc., in mathematics 2013

Faculty of Science - Fayoum University

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**Approval Sheet**  
**STUDY THE EFFECT OF CERTAIN KINDS OF MAPPINGS**  
**ON THE RINGS**

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# Abstract

This thesis continues the line of research in the literature concerning specific known types of mappings on rings. Such mappings satisfy certain combinations of elements in rings, for example, derivations, generalized derivations, left multipliers and homoderivations.

We study the effect of derivations, generalized derivations, left multipliers and homoderivations which satisfy some conditions on some appropriate subsets (ideal, Lie ideal or others subsets) of prime or semiprime rings. Besides, we are interested to determine the relationship between the commutativity of prime and semiprime rings and the existence of certain kinds of maps.

Also, we introduce the center-like subsets  $Z_1(S, f)$ ,  $Z^{***}(S, F, d)$ ,  $Z_1(S, F, d)$  and  $Z_0(S, f)$ , where  $R$  is a ring,  $S$  is a specific subset of  $R$ ,  $F$  is a generalized derivation associated with a derivation  $d$ , and  $f$  is a map from  $R$  into  $R$ . In case  $R$  is a prime ring and  $f$  is a derivation, generalized derivation or homoderivation, we prove that these sets coincide with the center of  $R$ .