Ain Shams University
University College for Women
(Arts, Science, and Education)
Department of Mathematics

The Transfer of some Algebraic Properties from Rings and Modules into Their Extentions

A THESIS
SUBMITTED IN PARTIAL FULFILLMENT OF REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE (M.Sc.)
(PURE MATHEMATICS)

BY

Asmaa Naser Muhammed Elsayed

Department of Mathematics
University College for Women
Ain Shams University

SUPERVISORS

Prof. Dr. Mohamed Hussein Fahmy
Professor of Pure Mathematics
Faculty of Science
Al-Azhar University
(Deceased)

Prof. Dr. Gamal A. F. Ismail
Professor of Pure Mathematics
University College for Women
Ain Shams University

Prof. Dr. Abdel Rahman Mohamed Hassanein
Professor of Pure Mathematics
Faculty of Science
Al-Azhar University

(2020)

Ain Shams University
University College for Women
(Arts, Science, and Education)
Department of Mathematics

M.Sc. Thesis
(PURE MATHEMATICS)

Title of Thesis:

The Transfer of some Algebraic Properties from Rings and Modules into Their Extentions

Thesis supervisors:

Prof. Dr. Mohamed Hussein Fahmy
Professor of Pure Mathematics
Faculty of Science
Al-Azhar university
(Deceased)

Prof. Dr. Gamal A. F. Ismail
Professor of Pure Mathematics
University College for Women
Ain Shams University

Prof. Dr. Abdel Rahman Mohamed Hassanein
Professor of Pure Mathematics
Faculty of Science
Al-Azhar university

Ain Shams University
University College for Women
(Arts, Science, and Education)
Department of Mathematics

COURSES

The student has passed the following courses in partial fulfillment of requirement for M. Sc. degree:

1.	**Advanced Abstract Algebra.**	**3h per week**
2.	**Numbers Theory.**	**3h per week**
3.	**Numerical Analysis.**	**3h per week**
4.	**Writing Scientific Research.**	**3h per week**
5.	**Partial Differential Equations.**	**3h per week**
6.	**Differential Geometry.**	**3h per week**
7.	**Spectral Theory and its Applications.**	**3h per week**
8.	**Ethics of Scientific Research.**	**3h per week**

Head of Mathematics Department


ACKNOWLEDGMENTS

Acknowledgements

In the name of Allah, the most merciful, the most compassionate all praise be to Allah, the lord of the worlds; and prayers and peace be upon Mohammed his servant and messenger.

First and foremost, I must acknowledge my limitless thanks to Allah, the ever –magnificent; the ever-thankful, for his help and bless. I am totally sure that this work would have never become truth, without his guidance.

All my profound gratitude goes to my supervisors, my Godfather Prof. Mohammed Hussein Fahmy, Professor of pure mathematics Al - Azhar university, to Prof. Gamal A. F. Ismail, Professor of pure mathematics university college for women - Ain shams university. And to Prof. Abd El - Rahman Mohammed, Professor of pure mathematics Al - Azhar university.

And my special thankful to Prof. Refaat Salem, Professor of pure mathematics Al - azhar university and Dr. Ramy Elsayed, lecturer in Al - Azhar university. For patient guidance to me, encouragement and advice , they have provided throughout my time as their student, also for their encouragement and normal support to me to go on deeply and to exhibit and extract new ideas.

All members of the "Algebra seminar" in Al-zhar university have been brilliantly, friendly and patient collaborators while introducing me to the world of abstract algebra...

Last and not the least, I would like to thank my family for all their love and support. For my parents who raised me with a love and encouragement.

Thank you

Asmaa Nasser.


ABSTRACT

Abstract

It was shown by Galovich that if R is a commutative unique factorization ring (UFR) with identity, then R is a local ring with a nil maximal ideal. In this thesis, we generalize Galovich's results to the non-commutative case. Also, we generalize Chon's results to the non-commutative case , we show that if R satisfies ACC on principal right (left) ideals, then R is atomic. Moreover, we study UFR by using lattice structure.

Keywords : UFR; symmetric ring; local ring.

CONTENTS