

**TITLE OF THESIS : ON DERIVATIONS AND GENERALIZED  
DERIVATIONS OF PRIME RINGS**

**Name of Scholar : DEEPA MALIK**

**Name of Supervisor : PROF. MOHD. RAIS KHAN**

**Name of Co Supervisor : DR. V. N. DIXIT**

**Department : MATHEMATICS**

**Faculty : NATURAL SCIENCES**

## **ABSTRACT**

In this thesis entitled “**ON DERIVATIONS AND GENERALIZED DERIVATIONS OF PRIME RINGS**” we have studied the commutativity of prime rings admitting derivations and generalized derivations which are centralizing or commuting on some appropriate subsets of prime rings.

Over the last three decades, a number of authors have proved commutativity theorems for prime or semi prime rings admitting automorphisms or derivations which are centralizing or commuting on some appropriate subsets of  $R$ . In the year 2006, Oukhtite and others introduced the notion of prime rings. In this thesis, we have studied and extended most of the results valid for prime rings to prime rings. **Chapter 1** is introductory and contains definitions and results on evolution of prime rings, which are used in subsequent Chapters. In **Chapter 2**, we have discussed the derivations on ideals in prime rings. **Chapter 3** deals with the

generalized derivations on ideals in prime rings. In this Chapter, we have generalized the results on generalized derivations defined on semi prime rings by taking prime rings into consideration. In **Chapter 4**, we have studied the concept of derivation as well as generalized derivations on Lie ideals in prime rings. A number of authors have extended the results valid for ideals in prime rings by taking Lie ideals into consideration. In this context we establish the results proved in Chapter 2 for ideals in prime rings to Lie ideals. The concept of commutativity of a prime ring  $R$  admitting generalized derivation  $F$  associated with a derivation  $d$  has been generalized by taking into account the generalized derivations associated with derivation  $d$  defined on prime rings. In **Chapter 5**, we study some more results concerning generalized derivation on Lie ideals in prime rings. We have extended the results on the commutativity of a prime ring  $R$  admitting a generalized derivation  $F$  with associated derivation  $d$  satisfying certain properties to prime rings.