ABSTRACT

The subject of derivation is the main area of interest in these days (see [1,3,5,7,11,13,14,19]). The main classes of rings, which are focused by the researchers, are Prime Rings and Semiprime Rings. Many results of C^*-algebra and B^*-algebra related to derivation are generalized in these classes of rings (see [8,10,14]). The certain mappings like commuting mappings (see [10,18]), centralizing mappings(see[5,15] and automorphisms (see [15]) play key role in the development of the theory of derivations in systematic way (see [16]).

Let R be a ring, then its substructures like Lie Ideals, Jordan Ideals, Prime Ideals and Semiprime Ideals play important role enhancing the theory of derivations. All these structures are discussed in some reasonable explanation in chapter 1.

In chapter 2, we focus our attention on J. Vukman paper (see[20]) and we review this paper in details and study derivations on semiprime rings.

In chapter 3, we extent the result of Vukman [20] discussed in chapter 2, in canonical fashion, by imposing some appropriate conditions.

The commutativity of Prime and Semiprime Rings are studied by many authors by imposing certain conditions on non-zero derivations. For example, Herstein [13] proved that if a non-zero derivation D on a prime ring with char$\neq$2 satisfies $[D(x)\ D(y)] = 0$ $\forall\, x,y \in R$, then R is commutative. Daif and Bell [9] proved that a Semiprime Ring R will be commutative if it admits a non zero derivation D such that $xy + D(xy) = yx + D(yx)\ \forall x, y \in R.$

Daif [10] also studied commutativity for Sermiprime Ring R with derivation D satisfying $D(x)D(y) + D(xy) = D(y)D(x) + D(yx)\ \forall x, y \in R.$

In chapter 4, we introduce the notion of (β,β)-symmetric derivation as a generalization of symmetric derivation (see[17]) and we study the commutativity of Prime and Semiprime Ring through (β,β)-derivation (see theorem 4.1.19).