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- Title of the Thesis:———— On Monoid Rings

ABSTRACT: The present thesis entitled “**On Monoid Rings**” is a study of some abstract ring structures such as weak Armendariz, weak McCoy, central Armendariz and strongly reversible rings on monoid rings.

The work is organized in five chapters. Chapter 1, is an introductory which deals with the essential definitions, examples, lemmas, propositions and theorems of Armendariz, reversible, McCoy, \mathcal{S} -Armendariz (\mathcal{S} be a monoid) and \mathcal{S} -McCoy rings which are required to prove the results in subsequent chapters. This chapter also provides basic knowledge to those who are not acquainted with the subject matter of the present work.

Chapter 2, is a study of weak Armendariz rings and weak McCoy rings relative to monoid. In this chapter, we prove that if \mathcal{R} is a reduced and weak \mathcal{S} -Armendariz then \mathcal{R} is a weak $\mathcal{S} \times \mathcal{T}$ -Armendariz, where \mathcal{S} be a monoid and \mathcal{T} a u.p.-monoid. Further, we investigate that a ring \mathcal{R} is weak \mathcal{S} -Armendariz if and only if \mathcal{Q} is weak \mathcal{S} -Armendariz when \mathcal{R} a right Ore ring with classical right quotient ring \mathcal{Q} . Afterwards, we show that a ring \mathcal{R} is a right weak \mathcal{S} -McCoy ring if and only if \mathcal{Q} is a right weak \mathcal{S} -McCoy ring when \mathcal{R} be a right Ore ring with classical right quotient ring \mathcal{Q} .

In chapter 3, we study some of the important results of central Armendariz rings relative to monoid. For a monoid \mathcal{S} , we introduce the notion of central \mathcal{S} -Armendariz which is a generalization of central Armendariz rings as well as \mathcal{S} -Armendariz rings, and investigate its properties. We prove that the class of central \mathcal{S} -Armendariz rings

lies strictly between the classes of \mathcal{S} -Armendariz rings and abelian rings. Moreover, we show that an abelian ring, \mathcal{S} -Armendariz ring, central \mathcal{S} -Armendariz ring, $\mathcal{S} \times \mathcal{T}$ -Armendariz ring and central $\mathcal{S} \times \mathcal{T}$ -Armendariz ring are equivalent, when \mathcal{S} and \mathcal{T} be u.p.-monoids and \mathcal{R} a right PP-ring. Further, we show that a ring \mathcal{R} is central \mathcal{S} -Armendariz if and only if \mathcal{Q} is central \mathcal{S} -Armendariz, where \mathcal{R} is right Ore ring with classical right quotient ring \mathcal{Q} .

Next, chapter 4, is a study of strongly reversible rings relative to monoid. Here, in this chapter, we define a new structure of rings “strongly \mathcal{S} -reversible ring” which is a generalization of strongly reversible rings and extend some of the results of the strongly reversible rings to strongly \mathcal{S} -reversible rings. We investigate that a finitely generated abelian group \mathcal{G} is torsion free if and only if there exists a ring \mathcal{R} with $|\mathcal{R}| \geq 2$ such that \mathcal{R} is strongly \mathcal{G} -reversible. Further, we prove that if \mathcal{R} is reduced and \mathcal{S} -Armendariz ring, then a ring \mathcal{R} is strongly \mathcal{S} -reversible if and only if \mathcal{R} is strongly $\mathcal{S} \times \mathcal{T}$ -reversible, where \mathcal{S} be a monoid and \mathcal{T} u.p.monoid. Moreover, we investigate that a ring \mathcal{R} is strongly \mathcal{S} -reversible if and only if \mathcal{Q} is strongly \mathcal{S} -reversible when \mathcal{R} be a right Ore ring with classical right quotient ring \mathcal{Q} of a ring \mathcal{R} .

Last of the thesis, chapter 5, is a study of zip skew monoid rings. In this chapter, we investigate that a ring \mathcal{R} is a right zip ring if and only if skew monoid ring $\mathcal{R} * \mathcal{S}$ (induced by a monoid homomorphism $\lambda : \mathcal{S} \rightarrow \text{Aut}(\mathcal{R})$) is a right zip ring when \mathcal{R} is a right (\mathcal{S}, λ) -McCoy ring, where \mathcal{S} be a u.p.-monoid. Moreover, we study the relationship between right zip property of a ring \mathcal{R} and skew generalized power series ring $\mathcal{R}[[\mathcal{S}, \omega]]$ (induced by a monoid homomorphism $\omega : \mathcal{S} \rightarrow \text{End}(\mathcal{R})$) over \mathcal{R} when \mathcal{R} is (\mathcal{S}, ω) -Armendariz and \mathcal{S} -compatible, where \mathcal{S} be a strictly ordered monoid, which provides a unified solution to the questions raised by Faith (in 1991).