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EULERIAN OF THE ZERO DIVISOR GRAPH $\Gamma[\mathbb{Z}_n]$

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Abstract: The Zero divisor Graph of a commutative ring R, denoted by $\Gamma[R]$, is a graph whose vertices are non-zero zero divisors of R and two vertices are adjacent if their product is zero. We consider the zero divisor graph $\Gamma[\mathbb{Z}_n]$, for any natural number n and find out which graphs are Eulerian graphs.

Keywords and Phrases: Zero divisor graph, Euler tour, Euler graph.

2010 Mathematics Subject Classification: 05C12, 05C25, 05C50.

1. Introduction

The concept of the Zero divisor graph of a ring R was first introduced by I. Beck [3] in 1988 and later on Anderson and Livingston [2], Akbari and Mohammadian [1] continued the study of zero divisor graph by considering only the non-zero zero divisors. The concepts of the Euler graph found in [4]. In this paper we introduce the concepts of the Euler graph to the zero divisor graph $\Gamma[\mathbb{Z}_n]$ and identify which zero divisors graphs are Eulerian.

In this article, section 2, is about the preliminaries and notations related to zero divisor graph of a commutative ring R, in section 3, we derive the Euler graphs of a zero divisor graph $\Gamma[\mathbb{Z}_{p^n}]$, and in section 4, we discuss about Euler graphs of $\Gamma[\mathbb{Z}_n]$ for any natural number n.