THE PARTITION DIMENSION FOR TOTAL GRAPH AND REGULAR GRAPH OF A COMMUTATIVE RING

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Abstract

The total graph of ring \( R \), denoted by \( T(\Gamma(R)) \) is a graph with all elements of \( R \) as vertices, and two distinct vertices \( x, y \in R \), are adjacent if and only if \( x + y \in Z(R) \), where \( Z(R) \) is the set of zero-divisors of \( R \). The induced subgraph of \( T(\Gamma(R)) \) with vertices on the regular elements \( \text{Reg}(R) \) denoted by \( \text{Reg}(\Gamma(R)) \) be a regular graf of ring \( R \), and the other induced subgraph of \( T(\Gamma(R)) \) with vertices on the set of zero-divisor elements \( Z(R) \) denoted by \( Z(\Gamma(R)) \). Ring used in this research is ring of integers modulo \( n \), denoted by \( \mathbb{Z}_n \). This research show that the partition dimension of a total graph, regular graph, and the induced subgraph with vertices on the set of zero-divisor elements are related to ring characteristic, and the set of zero-divisor that compose a graph. And also obtain relation between the partition dimension of a total graph with the partition dimension of a regular graph that composed of a commutative ring.

Key-words: The Total Graph, Regular Graph, Partition Dimension