ON THE TOTAL GRAPH OF A COMMUTATIVE RING

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ABSTRACT

The ideal of associating a graph to a discrete structure started from the construction of Cayley graph from groups. Some 20 years ago, this concept was extended to commutative rings by I. Beck through a construction called zero-divisor graph of a commutative ring. Thereafter it was modified and well studied by D.F. Anderson and subsequent researchers. Since then so many graph constructions were introduced in the literature. One of the generalizations is the total graph introduced by D.F. Anderson and Ayman Badawi in 2008. Let R be a commutative ring and $Z(R)$ be its set of all zero-divisors. The total graph $T_\Gamma(R)$ is the simple undirected graph with vertex set R and two distinct vertices x and y are adjacent if $x + y \in Z(R)$. In this talk, we discuss certain properties of the total graph. In particular, we discuss about the domination number, dominating sets, intersection graph of gamma sets in the total graph. Further we elaborate certain recent generalizations of the total graph.

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