

ON THE GENUS OF THE CO-ANNIHILATING GRAPH OF COMMUTATIVE RINGS

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Abstract

Let R be a commutative ring with identity and \mathfrak{U}_R be the set of all non-zero non-units of R . The *co-annihilating graph* of R , denoted by \mathcal{CA}_R , is a graph with vertex set \mathfrak{U}_R and two vertices x and y are adjacent whenever $\text{ann}(x) \cap \text{ann}(y) = (0)$. In this paper, we characterize all commutative Artinian non-local rings R for which the \mathcal{CA}_R has genus one and two. Also we characterize all commutative Artinian non-local rings R for which \mathcal{CA}_R has crosscap one. Finally, we characterize all finite commutative non-local rings for which $g(\Gamma_2(R)) = g(\mathcal{CA}_R) = 0$ or 1 .

Keywords: co-annihilating graph, planar graph, genus; crosscap.

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