

## Wiener Index and Mean Distance of Zero-Divisor Type Graph of Ring of Integers Modulo $n$

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### Abstract

The zero-divisor type graph was first introduced as the compression of the zero-divisor graph by partitioning the vertices. For ring of integers modulo  $n$ ,  $nZ$ , the non zero-divisor type graph of  $nZ$  is a graph with vertex set contains  $d \in T$ , where  $d$  is nontrivial divisor of  $n$ . Two distinct vertices,  $i \in T$  and  $j \in T$  are adjacent if  $ij \neq 0$ . The study of Wiener index and mean distance of a graph serves as a tool to calculate the sum of the distances between vertices in graph. The objective of this research is to compute the Wiener index and mean distance of the zero-divisor type graph of  $nZ$ , for  $n = p_1^{a_1} p_2^{a_2} \dots p_k^{a_k}$ . Besides, the structure for the graph is determined. The Wiener index and mean distance of zero-divisor type graph of  $nZ$  have been found to be constant for each factorization of  $n$ .