

## SIGNED ROMAN EDGE $k$ -DOMINATION IN GRAPHS

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### Abstract

Let  $k \geq 1$  be an integer, and  $G = (V, E)$  be a finite and simple graph. The closed neighborhood  $N_G[e]$  of an edge  $e$  in a graph  $G$  is the set consisting of  $e$  and all edges having a common end-vertex with  $e$ . A signed Roman edge  $k$ -dominating function (SRE $k$ DF) on a graph  $G$  is a function  $f : E \rightarrow \{-1, 1, 2\}$  satisfying the conditions that (i) for every edge  $e$  of  $G$ ,  $\sum_{x \in N_G[e]} f(x) \geq k$  and (ii) every edge  $e$  for which  $f(e) = -1$  is adjacent to at least one edge  $e'$  for which  $f(e') = 2$ . The minimum of the values  $\sum_{e \in E} f(e)$ , taken over all signed Roman edge  $k$ -dominating functions  $f$  of  $G$  is called the signed Roman edge  $k$ -domination number of  $G$ , and is denoted by  $\gamma'_{sRk}(G)$ . In this paper we initiate the study of the signed Roman edge  $k$ -domination in graphs and present some (sharp) bounds for this parameter.

**Keywords:** signed Roman edge  $k$ -dominating function, signed Roman edge  $k$ -domination number.

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