The Forcing Restrained Edge Monophonic Domination Number of a Graph

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Abstract

In the paper the concept of the forcing restrained edge monophonic domination number $f_{re}^{\gamma}(G)$ of a graph $G$ is introduced. For a connected graph $G = (V, E)$ of order at least two, and $M$ is a minimum restrained edge monophonic dominating set of $G$. A subset $T \subseteq M$ is called a forcing subset for $M$ if $M$ is the unique minimum set containing $T$. A forcing subset for $M$ of minimum cardinality is a minimum forcing subset of $M$. The forcing restrained edge monophonic domination number of $M$, denoted by $f_{re}^{\gamma}(M)$, is the cardinality of a minimum forcing subset of $M$. The forcing restrained edge monophonic domination number of $G$, denoted by $f_{re}^{\gamma}(G)$, is $f_{re}^{\gamma}(G) = \min \{f_{re}^{\gamma}(M)\}$, where the minimum is taken over all minimum sets $M$ in $G$. Forcing restrained edge monophonic domination number of definite connected graphs are accomplished. We determine bounds for it and characterize graphs which realize these bounds. It is shown that for every integers $a$, $b$, and $c$ with $0 < a < b < c$ and $b, c \geq 2$ there exists a connected graph $G$ such that $f_{re}^{\gamma}(G) = f_{re}^{\gamma}(G) = f_{em}(G) = 0$, $em(G) = a$, $\gamma_{em}(G) = b$ and $\gamma_{re}^{\gamma}(G) = c$. For every integers $a$, $b$, and $c$ with $0 \leq a < b < c$ and $b > a + 1$, there exists a connected graph $G$ such that $f_{re}^{\gamma}(G) = 0$, $f_{em}(G) = a$, $\gamma_{em}(G) = b$ and $em_r(G) = c$. For every integers $a$, $b$, and $c$ with $0 \leq a < b \leq c$ and $b > a + 1$, there exists a connected graph $G$ such that $f_{re}^{\gamma}(G) = 0$, $f_{em}(G) = a$, $\gamma_{em}(G) = b$ and $\gamma_{re}^{\gamma}(G) = c$.

Keywords: Edge monophonic dominating set, edge monophonic domination number, restrained edge monophonic dominating set, restrained edge monophonic domination number, forcing restrained edge monophonic dominating set and forcing restrained edge monophonic domination number.

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