ETERNAL $m$-SECURITY BONDAGE NUMBERS IN GRAPHS

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Abstract

An eternal $m$-secure set of a graph $G = (V, E)$ is a set $S_0 \subseteq V$ that can defend against any sequence of single-vertex attacks by means of multiple guard shifts along the edges of $G$. The eternal $m$-security number $\sigma_m(G)$ is the minimum cardinality of an eternal $m$-secure set in $G$. The eternal $m$-security bondage number $b_{\sigma_m}(G)$ of a graph $G$ is the minimum cardinality of a set of edges of $G$ whose removal from $G$ increases the eternal $m$-security number of $G$. In this paper, we study properties of the eternal $m$-security bondage number. In particular, we present some upper bounds on the eternal $m$-security bondage number in terms of eternal $m$-security number and edge connectivity number, and we show that the eternal $m$-security bondage number of trees is at most 2 and we classify all trees attaining this bound.

Keywords: eternal $m$-secure set, eternal $m$-security number, eternal $m$-security bondage number.

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References


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