UPPER BOUNDS ON ISOLATION PARAMETERS FOR TREES

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The concept of isolation in graphs arises by relaxing the condition of domination [1]. Let D be a set of vertices of a graph $G = (V, E)$ and denote by $N[D]$ the set of vertices in D or with a neighbour in D. We say that D is *isolating* if the subgraph induced by $V - N[D]$ has no edges. In general, if $\mathcal{F}$ is a set of graphs, we say that D is *$\mathcal{F}$-isolating* if no subgraph of $G - N[D]$ is a copy of a member of $\mathcal{F}$ [2]. Hence, usual domination and isolation correspond to $\mathcal{F}$-isolation for the sets $\mathcal{F} = \{K_1\}$ and $\mathcal{F} = \{K_2\}$, respectively. In this work, we study $\mathcal{F}$-isolation when $\mathcal{F}$ consists of the k-star $K_{1,k}$ for some $k \geq 1$. Concretely, we establish some upper bounds on the minimum cardinality of a $\{K_{1,k}\}$-isolating set for trees and characterize all trees attaining the given bounds.

References

[1] R. Boutrig, M. Chellali, T.W. Haynes and S. Hedetniemi, Vertex-edge domination in graphs. Aequationes Mathematicae 90 (2016), 355–366.

[2] Y. Caro and A. Hansberg, Partial domination - the isolation number of a graph. Filomat 31(12) (2017), 3925–3944.