

Title: Global signed total domination in graphs

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A function $f : V(G) \rightarrow \{-1, 1\}$ defined on the vertices of a graph G is a signed total dominating function (STDF) if the sum of its function values over any open neighborhood is at least one. A STDF f of G is called a global signed total dominating function (GSTDF) if f is also a STDF of the complement $\overline{G}$ of G . The global signed total domination number $\gamma_{gst}(G)$ of G is defined as $\gamma_{gst}(G) = \min\{\sum_{v \in V(G)} f(v) \mid f \text{ is a GSTDF of } G\}$. In this paper first we find lower and upper bounds for the global signed total domination number of a graph. Then we prove that if T is a tree of order $n \geq 4$ with $\Delta(T) \leq n - 2$, then $\gamma_{gst}(T) \leq \gamma_{st}(T) + 4$. We characterize all the trees which satisfy the equality. We also characterize all trees T of order $n \geq 4$, $\Delta(T) \leq n - 2$ and $\gamma_{gst}(T) = \gamma_{st}(T) + 2$.

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