

On Subset Labelings of Trees

Gary Chartrand, Ebrahim Salehi* and Ping Zhang

Western Michigan University and University of Nevada Las Vegas*

For a nontrivial graph G , a subset labeling of G is a labeling of the vertices of G with nonempty subsets of the set $[r] = \{1, 2, \dots, r\}$ for a positive integer r such that two vertices of G have disjoint labels if and only if the vertices are adjacent. The subset index $\rho(G)$ of G is the minimum positive integer r for which G has such a subset labeling from the set $[r]$. If T is a tree of diameter d , then $\rho(P_{d+1}) \leq \rho(T)$.

In this talk, among other results, it is shown that there are several classes of trees T of diameter d with $\rho(T) = \rho(P_{d+1})$ and for every pair a, b of integers with $4 \leq a \leq b$, there exists a tree T of diameter d such that $\rho(P_{d+1}) = a$ and $\rho(T) = b$. Sharp bounds are established for the subset indices of the starlike trees $S_r(K_{1,t})$ obtained by subdividing each edge of the star $K_{1,t}$ a total of r times. Also, some open questions on subset indices of trees are presented.

Keywords: subset labeling, subset index, starlike tree.