

On k -connected Restrained Domination in Graphs

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Let $G = (V, E)$ be a graph. A k -connected restrained dominating set is a set $S \subseteq V$, where S is a restrained dominating set and $G[S]$ has at most k components. The k -connected restrained domination number of G , denoted by $\gamma_r^k(G)$, is the smallest cardinality of a k -connected restrained dominating set of G .

In this talk, I will give some exact values and sharp bounds for $\gamma_r^k(G)$. Then the necessary and sufficient conditions for $\gamma_r(G) = \gamma_r^1(G) = \gamma_r^2(G)$ are given if G is a tree or a unicyclic graph. Finally, I will show that if T is a tree of order n , then $\gamma_r^k(T) \geq \max\{\lceil \frac{n+2}{3} \rceil, n - 2(k - 1)\}$. Moreover, I will constructively characterize the extremal trees T of order n achieving this lower bound.