INDEPENDENT RESTRICTED DOMINATION AND THE LINE DIGRAPH

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Abstract

Let $H$ be a digraph possibly with loops and let $D$ be a digraph whose arcs are colored with the vertices of $H$ (an $H$-colored digraph). A walk (path) $P$ in $D$ will be called an $H$-restricted walk (path) if the colors displayed on the arcs of $P$ form a walk in $H$. An $H$-restricted kernel $N$ is a set of vertices of $D$ such that for every two different vertices in $N$ there is no $H$-restricted path in $D$ joining them, and for every vertex $x$ in $V(D) \setminus N$ there exists an $H$-restricted path in $D$ from $x$ to $N$.

For the line digraph of $D$ we consider its inner arc-coloration, defined as follows: If $h$ is an arc of $D$ with color $c$ then any arc of the form $(x,h)$ in $L(D)$ also has color $c$.

We prove that the number of $H$-restricted kernels in an $H$-colored digraph is equal to the number of $H$-restricted kernels in the inner coloration of its line digraph.

Keywords: Domination, arc-coloration, kernel, line digraph.

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