

1077-05-2812

Catherine Kruger* (cikruger@eiu.edu), **Saad El-Zanati** and **Jessica Klister**. *On Rosa-type labelings of directed graphs.*

Let \mathbb{Z} denote the set of integers. For integers a and b with $a \leq b$, let $[a, b] = \{x \in \mathbb{Z} : a \leq x \leq b\}$. Let K_k^* denote the complete directed graph on k vertices. Let G be a directed graph with n arcs on $\leq n + 1$ vertices. A *labeling* of G is a one-to-one function $f: V(G) \rightarrow [0, n]$. If f is a labeling of G and $e = (u, v) \in E(G)$, let $\bar{f}(e) = f(v) - f(u)$ if $f(v) > f(u)$ and let $\bar{f}(e) = n + 1 + f(v) - f(u)$ if $f(v) < f(u)$. A labeling f of G is a *directed ρ -labeling* of G if $\{\bar{f}(e) : e \in E(G)\} = [1, n]$. It can be shown that for such a G , there exists a cyclic G -decomposition of K_{n+1}^* if and only if G admits a directed ρ -labeling. If G is bipartite, we define a labeling of G that leads to cyclic G -decompositions of K_{nx+1}^* for every positive integer x . We investigate these and other labelings of some classes of directed graphs and give the corresponding decomposition results. (Received September 22, 2011)