Lawrence Somer and Michal Křížek

Abstract

We assign to each pair of positive integers $k \geq 2$ and n a digraph $G(n, k)$ whose set of vertices is $H = \{0, 1, \ldots, n-1\}$ and for which there is a directed edge from $a \in H$ to $b \in H$ if $a^k \equiv b \pmod{n}$. The digraph $G(n, k)$ is symmetric of order M if its set of components can be partitioned into disjoint subsets, each containing exactly M isomorphic components. Deng and Yuan completely characterized all symmetric digraphs of order M when $M = 2$ or M is divisible by an odd prime. We demonstrate that their classification is complete by showing that there are no symmetric digraphs $G(n, k)$ of order 2^s for $s \geq 2$.