Applications of labeled graphs

Dr. Sudhakar Shetty

Alva’s Institute of Engineering and Technology, India

Graph labelings, where the vertices and edges are assigned, real values or subsets of a set subject to certain conditions, have often been motivated by their utility to various applied fields and their intrinsic mathematical interest (logico - mathematical). An enormous body of literature has grown around the subject, especially in the last forty years or so, and is still getting embellished due to increasing number of application driven concepts.

Definition 1 (Bloom and Hsu) A Digraph $D$ with $e$ edges is labeled by assigning a distinct integer value $\theta(v)$ from $\{0, 1, 2, \ldots, e\}$ to each vertex $v$. The vertex values, in turn, induce a value $\phi(u, v)$ on each edge $(u, v)$ where $\phi(u, v) = \theta(v) - \theta(u) \mod(e+1)$.

If the edge values are all distinct then the labeling is graceful. A Digraph is graceful if it has a graceful labeling.

In this talk we present proofs of some conjectures on graceful directed graphs and discuss the applications of graceful directed graphs in characterizing some algebraic structures like Sequenceable groups, Complete mappings and Neofields etc.

Keywords: Graceful digraphs, Unicyclic wheels, system of congruences.

References


Dr. Sudhakar Shetty@drsshetty@yahoo.com