Abstract

Let $\mathbb{N}_0$ be the set of all non-negative integers, let $X \in \mathbb{N}_0$ and $P(X)$ be the power set of $X$. An integer additive set-labeling (IASL) of a graph $G$ is an injective function $f : V(G) \to P(\mathbb{N}_0)$ such that the induced function $f^+ : E(G) \to P(\mathbb{N}_0)$ is defined by $f^+(uv) = f(u) + f(v)$, where $f(u) + f(v)$ is the sum set of $f(u)$ and $f(v)$. An IASL $f$ is said to be an integer additive set-indexer (IASI) of a graph $G$ if the induced edge function $f^+$ is also injective. An integer additive set-labeling $f$ is said to be a weak integer additive set-labeling (WIASL) if $|f^+(uv)| = \max(|f(u)|; |f(v)|)$ for all $uv \in E(G)$. The minimum cardinality of the ground set $X$ required for a given graph $G$ to admit an IASL is called the set-labeling number of the graph. In this paper, the notion of the weak set-labeling number of a graph $G$ is introduced as the minimum cardinality of $X$ so that $G$ admits a WIASL with respect to the ground set $X$ and the weak set-labeling numbers of certain graphs are discussed.

Index Terms

Computer Science

Applied Mathematics

Keywords
Integer additive set-labeled graphs; weak integer additive set-labeled graphs; weak set-labeling number of a graph.