Abstract

Let \( \mathbb{N}_0 \) be the set of all non-negative integers, let \( X \subseteq \mathbb{N}_0 \) and \( P(X) \) be the power set of \( X \). An integer additive set-labeling (IASL) of a graph \( G \) is an injective function \( f : V(G) \rightarrow P(\mathbb{N}_0) \) such that the induced function \( f^+ : E(G) \rightarrow P(\mathbb{N}_0) \) 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.

References

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.