Cycles-Related Γ-Harmonious Graphs

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Harmonious labeling is one of the most extensively studied labeling schemes in graph theory. We extend its definition from cyclic groups to any finite Abelian groups. Let G = (V, E) be a graph with q edges and Γ an Abelian group of order q. We say that G is Γ -harmonious if there exists an injection $f: V \to \Gamma$ (called Γ -harmonious labeling) with the property that the induced labels w(e) of all edges, defined as w(xy) = f(x) + f(y) (where the addition is performed in Γ), are all distinct. We proved results on cycle-related classes of graphs such as wheels, windmills, prisms, and web graphs. We will also propose some open problems related to this labeling.

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