

12 Total Neighborhood Prime Labeling of Join Graphs

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Let G be a graph with $V(G)$ as the vertex set and $E(G)$ as the edge set. A bijective function $f : V(G) \cup E(G) \rightarrow \{1, 2, 3, \dots, |V(G) \cup E(G)|\}$ is said to be a total neighborhood prime labeling, if for each vertex in G having degree greater than 1, the gcd of the labels of its neighborhood vertices is 1 and the gcd of the labels of its induced edges is 1. A graph which admits a total neighborhood prime labeling is called a total neighborhood prime graph. In this chapter, we investigate total neighborhood prime labeling for some join graphs.

12.1 INTRODUCTION AND DEFINITIONS

In this chapter, we consider the simple, finite, connected and undirected graph $G = (V(G), E(G))$ with $V(G)$ as vertex set and $E(G)$ as edge set. For various notations and terminology of graph theory, we follow Gross and Yellen [3] and for some results of number theory, we follow Burton [2].

Let G be a graph with n vertices. A bijective function $f : V(G) \rightarrow \{1, 2, 3, \dots, n\}$ is said to be a **neighborhood-prime labeling** if for every vertex u in $V(G)$ with $\deg(u) > 1$, $\gcd \{f(p) | p \in N(u)\} = 1$, where $N(u) = \{w \in V(G) | uw \in E(G)\}$. A graph which admits neighborhood-prime labeling is called a neighborhood-prime graph.

The notion of neighborhood-prime labeling was introduced by Patel and Shrimali [4]. In [5] they proved the union of some graphs are neighborhood-prime graphs. They also proved that the product of some graphs are neighborhood-prime [6]. For a further list of results regarding neighborhood-prime graphs the reader may refer to [1].