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VERTEX-EDGE NEIGHBORHOOD PRIME LABELING IN THE CONTEXT OF CORONA PRODUCT

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Abstract: Let G be a graph with vertex set $V(G)$ and edge set $E(G)$. For $u \in V(G)$, $N_V(u) = \{w \in V(G) | uw \in E(G)\}$ and $N_E(u) = \{e \in E(G) | e = uv, \text{ for some } v \in V(G)\}$. A bijective function $f : V(G) \cup E(G) \to \{1, 2, 3, \ldots, |V(G) \cup E(G)|\}$ is said to be a vertex-edge neighborhood prime labeling, if for $u \in V(G)$ with $deg(u) = 1$, gcd $\{f(w), f(uw) | w \in N_V(u)\} = 1$; for $u \in V(G)$ with $deg(u) > 1$, $gcd\{f(w) | w \in N_V(u)\} = 1$ and $gcd\{f(e) | e \in N_E(u)\} = 1$. A graph which admits a vertex-edge neighborhood prime labeling is called a vertex-edge neighborhood prime graph. In this paper we prove $K_{m,n} \odot K_1$, $W_n \odot K_1$, $H_n \odot K_1$, $F_n \odot K_1$ and $S(K_{1,n}) \odot K_1$ are vertex-edge neighborhood prime graphs.

Keywords and Phrases: Neighborhood-prime labeling, vertex-edge neighborhood prime labeling, corona product.

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1. Introduction and Definitions

All the graphs considered here are simple, finite, connected and undirected. $V(G)$ and $E(G)$ denote vertex set and edge set of G respectively. For various notations and terminology of graph theory, we follow Gross and Yellen [3] and for number theoretical results, we follow Burton [1].

Let G be a graph with n vertices. A bijective function $f : V(G) \to \{1, 2, 3, \ldots, n\}$ 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 $N(u) = \{w \in V(G) | uw \in E(G)\}$.