Co-prime Labelings of Graphs

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Let $G = (V, E)$ be a graph of order n: An injection $f : V \to \mathbb{N}$, where $\mathbb{N}$ is the set of natural numbers, is called a co-prime labeling of G if for any two distinct vertices $u, v \in V, uv \in E$ if and only if $f(u)$ and $f(v)$ are co-prime. A prime number p is said to be used in the co-prime labeling f if p divides $f(v)$ for some $v \in V$: We prove that every graph admits a co- prime labeling. Let $\mu(G, f)$ be the number of primes used in the co-prime labeling f and let $\mu(G) = min_f\{\mu(G, f) : f$ is a co-prime labeling of $G\}$. We obtain upper and lower bounds for $\mu(G)$. Further we determine the value of $\mu(G)$ for several classes of graphs.

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