On metric dimension of circulant graphs

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Abstract

Let G be a graph and let W be a subset of vertices of $V(G)$. If for every $u, v \in V(G)$ there is $w \in W$ such that $\mathrm{dist}(w,u) \neq \mathrm{dist}(w,v)$, then the set W is *resolvable*. The *metric dimension* of G is the cardinality of a minimum resolvable set.

The circulant graph $C_n(1,2,\ldots,t)$ is the Cayley graph $\mathrm{Cay}(\mathbb{Z}_n, \{\pm 1, \pm 2, \ldots, \pm t\})$. We prove that the metric dimension of $C_n(1,2,\ldots,t)$ is at least $\lceil \frac{2t}{3} \rceil + 1$ and we completely determine the cases when equality is attained.