SIGNED DOMINATION NUMBER
OF POWER OF A CYCLE

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Abstract

A graph is a power of cycle, denoted C_n^k, if $V(C_n^k) = \{1, 2, \ldots, n-1, n(=0)\}$ and $E(C_n^k) = E^1 \cup E^2 \cup \cdots \cup E^k$, where $E^i = \{(j, (j+i)(\mathrm{mod}\,n)) : 0 \le j \le n-1\}$ and $1 \le k \le \left\lfloor \dfrac{n-1}{2} \right\rfloor$ [2]. A function $f : V \to \{-1, 1\}$ is a signed dominating function (SDF) of G, if for every vertex $v \in V$, $f(N[v]) = \sum_{u \in N[v]} f(u) \ge 1$ [7]. The signed domination number, denoted by $\gamma s(G)$, is the minimum weight of SDF of G [7]. Such a SDF is called an *S-function* of G. We call a SDF as signed efficient dominating function (SEDF) if for every vertex $v \in V$, $f(N[v]) = 1$ when $|N[v]|$ is odd and $f(N[v]) = 2$ when $|N[v]|$ is even. In this paper, we give an upper bound for the signed domination number of C_n^k. Also, we identify some sub families of C_n^k admit SEDF. We prove that for all integers n and k such that $1 \le k \le \left\lfloor \dfrac{n-1}{2} \right\rfloor$, the graph C_n^k is excellent. Also we have established some infinite classes of graphs which are signed 2-excellent.

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