Discussiones Mathematicae
Graph Theory 35 (2015) 641–650
doi:10.7151/dmgt.1823

Full PDF
DMGT Page

UPPER BOUNDS ON THE SIGNED TOTAL (k, k)-DOMATIC NUMBER OF GRAPHS

Lutz Volkmann

Lehrstuhl II für Mathematik
RWTH Aachen University
52056 Aachen, Germany

e-mail: volkm@math2.rwth-aachen.de

Abstract

Let G be a graph with vertex set $V(G)$, and let $f : V(G) \longrightarrow \{-1, 1\}$ be a two-valued function. If $k \geq 1$ is an integer and $\sum_{x \in N(v)} f(x) \geq k$ for each $v \in V(G)$, where $N(v)$ is the neighborhood of v, then f is a signed total k-dominating function on G. A set $\{f_1, f_2, \ldots, f_d\}$ of distinct signed total k-dominating functions on G with the property that $\sum_{i=1}^{d} f_i(x) \leq k$ for each $x \in V(G)$, is called a signed total (k, k)-dominating family (of functions) on G. The maximum number of functions in a signed total (k, k)-dominating family on G is the signed total (k, k)-domatic number of G.

In this article we mainly present upper bounds on the signed total (k, k)-domatic number, in particular for regular graphs.

Keywords: signed total (k, k)-domatic number, signed total k-dominating function, signed total k-domination number, regular graphs.

2010 Mathematics Subject Classification: 05C69.

References

[1] T.W. Haynes, S.T. Hedetniemi and P.J. Slater, Fundamentals of Domination in Graphs (Marcel Dekker, Inc., New York, 1998).

[2] T.W. Haynes, S.T. Hedetniemi and P.J. Slater, Ed(s), Domination in Graphs, Advanced Topics (Marcel Dekker, Inc., New York, 1998).

[3] M.A. Henning, *Signed total domination in graphs*, Discrete Math. **278** (2004) 109–125.
doi:10.1016/j.disc.2003.06.002

[4] M.A. Henning, *On the signed total domatic number of a graph*, Ars Combin. **79** (2006) 277–288.

[5] S.M. Sheikholeslami and L. Volkmann, *Signed total (k,k)-domatic number of a graph*, AKCE Int. H. J. Graphs Comb. **7** (2010) 189–199.

[6] C. Wang, *The signed k-domination numbers in graphs*, Ars Combin. **106** (2012) 205–211.

[7] B. Zelinka, *Signed total domination number of a graph*, Czechoslovak. Math. J. **51** (2001) 225–229.
doi:10.1023/A:1013782511179

Received 20 August 2013
Revised 15 April 2014
Accepted 19 January 2015