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 $\{f_1, f_2, \dots, f_d\}$ 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