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ON THE SIGNED (TOTAL) k-INDEPENDENCE NUMBER IN GRAPHS

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Abstract

Let G be a graph. A function $f : V(G) \to \{-1, 1\}$ is a signed k-independence function if the sum of its function values over any closed neighborhood is at most $k - 1$, where $k \geq 2$. The signed k-independence number of G is the maximum weight of a signed k-independence function of G. Similarly, the signed total k-independence number of G is the maximum weight of a signed total k-independence function of G. In this paper, we present new bounds on these two parameters which improve some existing bounds.

Keywords: domination in graphs, signed k-independence, limited packing, tuple domination.

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References

[1] M. Chellali, O. Favaron, A. Hansberg and L. Volkmann, *k-domination and k-independence in graphs: A survey*, Graphs Combin. **28** (2012) 1–55. doi:10.1007/s00373-011-1040-3

[2] R. Gallant, G. Gunther, B.L. Hartnell and D.F. Rall, *Limited packing in graphs*, Discrete Appl. Math. **158** (2010) 1357–1364. doi:10.1016/j.dam.2009.04.014

[3] A.N. Ghameshlou, A. Khodkar and S.M. Sheikholeslami, *On the signed bad numbers of graphs*, Bulletin of the ICA **67** (2013) 81–93.

[4] F. Harary and T.W. Haynes, *Double domination in graphs*, Ars Combin. **55** (2000) 201–213.

[5] V. Kulli, *On n-total domination number in graphs*, in: Graph Theory, Combinatorics, Algorithms and Applications, SIAM (Philadelphia, 1991) 319–324.

[6] D.A. Mojdeh, B. Samadi and S.M. Hosseini Moghaddam, *Limited packing vs tuple domination in graphs*, Ars Combin., to appear.

[7] D.A. Mojdeh, B. Samadi and S.M. Hosseini Moghaddam, *Total limited packing in graphs*, submitted.

[8] L. Volkmann, *Signed k-independence in graphs*, Cent. Eur. J. Math. **12** (2014) 517–528. doi:10.2478/s11533-013-0357-y

[9] L. Volkmann, *Signed total k-independence number in graphs*, Util. Math., to appear.

[10] H.C. Wang and E.F. Shan, *Signed total 2-independence in graphs*, Util. Math. **74** (2007) 199–206.

[11] H.C. Wang, J. Tong and L. Volkmann, *A note on signed total 2-independence in graphs*, Util. Math. **85** (2011) 213–223.

[12] D.B. West, Introduction to Graph Theory (Second Edition) (Prentice Hall, USA, 2001).

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