

KIRCHOFF INDEX OF WEIGTED GRAPHS

Gülistan Kaya Gök¹, Nursah Mutlu², Serife Büyükköse³

¹*Hakkari University, Hakkari, Turkey*

²*Gazi University, Ankara, Turkey*

³*Gazi University, Ankara, Turkey*

MSC 2000: 05C50

Abstract

Let G be a simple, connected graph. The Kirchoff index of G defined as

$$Kf(G) = \sum_{i < j} r_{ij}.$$

In this paper, we define Kirchoff index for the simple connected weighted graphs which edge weights are positive real numbers or positive definite matrices. Furthermore we will give some properties of Kirchoff index for weighted graphs.

Keywords: Weighted graphs, Laplacian matrices, Kirchoff index

References

- [1] P. Dankelmann, Average distance in weighted graphs, *Discrete Mathematics* 312 (2012) 12-20.
- [2] D. J. Klein, M. Randic, Resistance distance, *J. Math. Chem.* 12(1993) 81-95.
- [3] Sorgun, S. and Büyükköse, S., On the bounds for the largest Laplacian eigenvalues of weighted graphs, *Discrete Optimization*, 9(2012), 122-129.
- [4] Sorgun, S. and Büyükköse, S., The new upper bounds on the spectral radius of weighted graphs, *Applied Mathematics and Computation*, 218(2012), 5231-5238.
- [5] C. Vasudev, *Graph Theory With Applications*. (1). New Delhi / Indian: New Age International Publishers, (2006) 4-5, 21, 56-57.
- [6] H. Zhang, Y. Yang. C. Li, Kirchoff index of composite graphs, *Discrete Applied Mathematics*, 157(2009) 2918-2927.
- [7] B. Zhou, N. Trinajstic, A note on Kirchoff index, *Chemical Physics Letters* 455(2008) 120-123.

¹First Author's e-mail: gulistankayagok@hakkari.edu.tr

²Second Author's e-mail: nursah.mutlu@os.gazi.edu.tr

³Third Author's e-mail: sbuyukkose@gazi.edu.tr