THE DISTANCE MAGIC INDEX OF A GRAPH

ALOYSIUS GODINHO, TARKESHWAR SINGH

Department of Mathematics
Birla Institute of Technology and Science Pilani
K K Birla Goa Campus, NH-17B, Zuarinagar, Goa, India

e-mail: p2014001@goa.bits-pilani.ac.in
tksingh@goa.bits-pilani.ac.in

AND

S. ARUMUGAM¹

National Centre for Advanced Research in Discrete Mathematics
Kalasalingam University Anand Nagar
Krishnankoil-626 126, Tamil Nadu, India

e-mail: s.arumugam.klu@gmail.com

Abstract

Let G be a graph of order n and let S be a set of positive integers with $|S| = n$. Then G is said to be S -magic if there exists a bijection $\phi : V(G) \rightarrow S$ satisfying $\sum_{x \in N(u)} \phi(x) = k$ (a constant) for every $u \in V(G)$. Let $\alpha(S) = \max\{s : s \in S\}$. Let $i(G) = \min \alpha(S)$, where the minimum is taken over all sets S for which the graph G admits an S -magic labeling. Then $i(G) - n$ is called the distance magic index of the graph G . In this paper we determine the distance magic index of trees and complete bipartite graphs.

Keywords: distance magic labeling, distance magic index, S -magic graph, S -magic labeling.

2010 Mathematics Subject Classification: 05C78.

REFERENCES

¹Also at Department of Computer Science, Liverpool Hope University, Liverpool, UK; Department of Computer Science, Ball State University, USA.

- [1] S. Arumugam, D. Froncek and N. Kamatchi, *Distance magic graphs—a survey*, J. Indones. Math. Soc. Special Edition (2011) 11–26.
doi:10.22342/jims.0.0.15.11-26
- [2] A. Godinho, T. Singh and S. Arumugam, *On S-magic graphs*, Electron. Notes Discrete Math. **48** (2015) 267–273.
doi:10.1016/j.endm.2015.05.040
- [3] J.A. Gallian, *A dynamic survey of graph labeling*, Electron. J. Combin. (2014) #DS6.
- [4] M. Miller, C. Rodger and R. Simanjuntak, *Distance magic labelings of graphs*, Australas. J. Combin. **28** (2003) 305–315.
- [5] A. Rosa, *On certain valuations of the vertices of a graph*, in: Theory of Graphs (International Symp., Rome, 1966), (Gordon and Breach, New York and Paris, 1967) 349–355.
- [6] D.B. West, Introduction to Graph Theory (Prentice-Hall of India, 1999).

Received 28 June 2016

Revised 20 October 2016

Accepted 20 October 2016