Complementary Eccentric Uniform Labeling Graphs

Research Article

K.K. Usha[1],* and K.A. Germina[2]

[1] PG Department of Mathematics, Pazhassi Raja N.S.S. College, Mattanur 670702, India
[2] Department of Mathematics, Central University of Kerala, Kasaragod 671316, India
*Corresponding author: ushaunnikk@gmail.com

Abstract. Given a graph $G = (V, E)$, a set $M \subset V$ is called Complementary Eccentric Uniform (CEU), if the M-eccentricity labeling $e_M(u) = \max\{d(u, v) : v \in M\}$ is identical for all $u \in V - M$. The least cardinality of a CEU set is called the CEU number of the graph G. In this paper we initiate a study on CEU labelled graphs and obtain bounds for certain graphs.

Keywords. CEU set; CEU number

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1. Introduction

For all terminology and notation in graph theory, we refer the reader to F. Harary [5]. Unless mentioned otherwise, all graphs considered in this paper are finite, simple and connected.

The eccentricity distribution over all nodes in a graph is an important property which has been studied in [8]. In [7], Linda Lesniak studied various properties of eccentricity sequences. The distance labeling of graphs has been widely studied in [4]. In network analysis there are situations in which a set of nodes are in equal distance from some other nodes or we want to keep some nodes at a particular distance from a set of nodes. Motivated from this we initiate a study on uniform eccentricity labeling in graphs.

2. Definitions and Results

Given a graph $G = (V, E)$, the distance between two vertices $d(u, v)$ is the length of the shortest $u - v$ path in G. The eccentricity $e(v)$ of a vertex v is $\max_{u \in V} d(u, v)$. The radius $\operatorname{rad} G$ is $\min_{v \in V} e(v)$