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Further Results on Locating Chromatic Number of Generalized Petersen Graphs

Asmiati, Agus Irawan, Suharsono, La Zakaria, Akmal Junaidi
Mathematics Departement, Faculty of Mathematics and Natural Sciences,
Lampung University, Indonesia
asmiati308@yahoo.com, asmiati.1976@fmipa.unila.ac.id

Abstract

Let G be a connected graph and c a proper coloring of G. For $i = 1, 2, \ldots, k$ define the color class C_i as the set of vertices receiving color i. The color code $c_\Pi(v)$ of a vertex v in is the ordered k-tuple $(d(v, C_1), \ldots, d(v, C_k))$ where $(d(v, C_1)$ is the distance of v to C_i. If all distinct vertices of G have distinct color codes, then c is called a locating-coloring of G. The locating-chromatic number of graph G, denoted by $\chi_L(G)$ is the smallest k such that G has a locating coloring with k colors. Let $\{u_1, u_2, \ldots, u_n\}$ be some vertices on the outer cycle and $\{v_1, v_2, \ldots, v_n\}$ be some vertices on the inner cycle, for $n \geq 3$. The Generalized Petersen graph, denoted by $P_{n,k}$, $n \geq 3$, $1 \leq k \leq \lfloor \frac{n-1}{2} \rfloor$, $1 \leq i \leq n$ is a graph that has $2n$ vertices $\{u_i\} \cup \{v_i\}$, and edges $\{u_i u_{i+1}\}$, $\{v_i v_{i+k}\}$, and $\{u_i v_i\}$. We determined that the locating chromatic number of Generalized Petersen Graphs $P_{n,1}$ is 4 for odd $n \geq 3$ or 5 for even $n \geq 4$. In this paper, we discuss the locating-chromatic number for certain operation of s Generalized Petersen Graphs $P_{n,1}$.

Keywords : *coloring, color code, locating-chromatic number, generalized Petersen graph.*