South East Asian J. of Mathematics and Mathematical Sciences Vol. 18, No. 3 (2022), pp. 369-380

DOI: 10.56827/SEAJMMS.2022.1803.31

ISSN (Online): 2582-0850

ISSN (Print): 0972-7752

DOUBLE ROMAN DOMINATION NUMBER OF MIDDLE GRAPH

Shailaja S. Shirkol, Pavitra P. Kumbargoudra^{*} and Meenal M. Kaliwal^{**}

Department of Mathematics, S. D. M. College of Engineering and Technology, Kalaghatagi Road, Dharwad - 580002, Karnataka, INDIA

E-mail : shailajashirkol@gmail.com

*Department of Mathematics, The Oxford College of Engineering, Hosur Road, Bangalore - 560068, Karnataka, INDIA

E-mail : pavitra2504@gmail.com

**Department of Mathematics, KLS's Vishwanathrao Deshpande Institute of Technology, Haliyal, Karnataka - 581329, INDIA

E-mail : mkaliwal@klsvdit.edu.in

(Received: Mar. 07, 2022 Accepted: Dec. 26, 2022 Published: Dec. 30, 2022)

Abstract: For any graph G(V, E), a function $f : V(G) \to \{0, 1, 2, 3\}$ is called Double Roman dominating function (DRDF) if the following properties holds,

- 1. If f(v) = 0, then there exist two vertices $v_1, v_2 \in N(v)$ for which $f(v_1) = f(v_2) = 2$ or there exist one vertex $u \in N(v)$ for which f(u) = 3.
- 2. If f(v) = 1, then there exist one vertex $u \in N(v)$ for which f(u) = 2 or f(u) = 3.

The weight of DRDF is the value $w(f) = \sum_{v \in V(G)} f(v)$. The minimum weight among all double Roman dominating function is called double Roman domination