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Notice for the PhD Viva Voce Examination

Ms Anisha Jean Mathias (Registration Number: 1881503), PhD scholar at the School of Sciences, CHRIST (Deemed to be University), Bangalore will defend her PhD thesis at the public viva-voce examination on Tuesday, 5 December, 2023 at 11.00 am in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru - 560029.

Title of the Thesis	:	**A Study on Domination in Signed Graphs**
Discipline	:	**Mathematics**
External Examiner (Outside Karnataka)	:	**Dr K Kalaiarasi** Professor Department of Mathematics Cauvery College of Women Annamalai Nagar, Trichy - 621218 Tamil Nadu
External Examiner (Within Karnataka)	:	**Dr B Chaluvaraju** Associate Professor Department of Mathematics Bangalore University Jnana Bharathi Campus Bengaluru -560056 Karnataka
Supervisor	:	**Dr Sangeetha Sathish** Assistant Professor Department of Mathematics School of Sciences CHRIST (Deemed to be University) Bengaluru – 560029 Karnataka

The members of the Research Advisory Committee of the Scholar, the faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva-voce examination.

Registrar

Place: Bengaluru
Date: 23 November 2023

ABSTRACT

Signed graphs, which represent the positive and negative interactions between networks, have gained significant attention in various fields, particularly social network analysis. Domination, a fundamental concept in graph theory, is important in understanding the structural characteristics of graphs and determining the minimum number of vertices needed to cover the entire graph. However, research on domination in the context of signed graphs has been limited, with most studies focusing on graphs. This thesis explores a variant of domination called restrained domination in signed graphs and investigates the characteristic properties of these signed graphs in relation to the restrained domination number.

Throughout the thesis, we establish exact values and bounds for the restrained domination number in different classes of signed graphs. Additionally, we examine the restrained domination property in various derived signed graphs, including the line signed graph, semi-total point signed graph, semi-total line signed graph, and total signed graph. Additionally, we study criticality concepts associated with the restrained dominateon number in signed graphs. Specifically, we analyze the effects of removing edges or vertices from signed graphs, as well as adding edges in signed graphs, on the restrained domination number. Further, we extend the concept of restrained domination number to encompass various variants, namely connected restrained domination number, restrained double domination number, and total restrained domination number for signed graphs. We derive relevant results and findings for these parameters, contributing to a deeper understanding of domination in signed graphs.

Keywords: signed graphs; domination number; restrained domination number; connected restrained domination number; restrained double domination number; total restrained domination number.

Publications:

1. **J. Mathias**, V. Sangeetha, and M. Acharya, "Restrained domination in signed graphs", Acta Universitatis Sapientiae, Mathematica, 12(1), 155—163, 2020.
2. **J. Mathias**, V. Sangeetha and M. Acharya, "Critical concepts of restrained domination in signed graphs", Discrete Mathematics, Algorithms and Applications, 1—11, 2021.
3. **J. Mathias**, V. Sangeetha and M. Acharya, "Restrained critical and abundant signed graphs", Advances and Applications in Discrete Mathematics, 38(1), 49-68, 2023.