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Notice for the PhD Viva Voce Examination

Ms Glory C (Registration Number: 2090224), 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 Monday, 10 June 2024 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 Coloring Parameters and Topological Indices of Graphs**
Discipline	:	**Mathematics**
External Examiner (Outside Karnataka)	:	**Dr Kalairasi K** Professor Department of Mathematics Cauvery College of Women Annamalai Nagar Trichy – 621218 Tamil Nadu
External Examiner (Within Karnataka)	:	**Dr Shanmukha B** Associate Professor and Head Department of Mathematics P. E. S. College of Engineering Mandya, Karnataka
Supervisor	:	**Dr Manjunath N** Associate Professor Department of Sciences and Humanities School of Engineering and Technology CHRIST (Deemed to be University) Bangalore Kengeri Campus Bengaluru-560074 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: 04 June 2024

ABSTRACT

Graph coloring/labeling is a fundamental concept in graph theory that involves the assignment of weights, integers, or colors to the vertices/edges or both of a graph while adhering to specific constraints. A research domain is established in which vertices of a graph are colored based on specific conditions, and color degrees are taken into consideration leading to the exploration of chromatic topological indices and various chromatic polynomials. The introduction of chromatic topological indices in response to challenges in chemical graph theory has sparked significant research interest, creating a dynamic and expansive field within graph theory. Motivated by this our study presents a comprehensive exploration of topological indices in the context of graph theory, specifically focusing on the Zagreb index and its chromatic variants. The study calculates the first and second rainbow chromatic Zagreb indices, rainbow chromatic irregularity indices, and rainbow chromatic total irregularity indices for well-known graph classes. Later, introduced the concept of b-chromatic Zagreb indices and b-chromatic irregularity indices and calculated the exact values for some standard graphs. Further, the rainbow chromatic topological indices and b-chromatic topological indices for various derived graphs of some graph classes are determined.

Novel graph polynomials, namely the b-chromatic Zagreb polynomials and b-chromatic irregularity polynomials, are introduced for some classes of graphs and few derived graphs. The study initially focused on conducting QSPR analysis using degree-based topological indices. Subsequently, the research expanded its scope to explore the practical application of chromatic topological indices in QSPR analysis for distinct molecular structures and drugs. This shift in focus allowed for a more comprehensive understanding of molecular interactions and facilitates innovative approaches in drug analysis and design.

Keywords: rainbow neighborhood coloring, b-coloring, rainbow chromatic Zagreb index, rainbow chromatic irregularity index, b-chromatic Zagreb index, b-chromatic irregularity index, b-chromatic Zagreb polynomial, b-chromatic irregularity polynomial, QSPR Analysis.

Publications:

1. **Glory C** and Manjunath N., "Some results on b-chromatic topological indices of some graphs", AIP Conference Proceedings, 2852(1), pp. 100002(1-10), 2023.
2. **Glory C** and Manjunath N., "Computation of b-Chromatic Topological Indices of Some Graphs and its Derived Graphs", South East Asian Journal of Mathematics and Mathematical Sciences, 19(2), pp. 241-260, 2023.
3. **Glory C**, Manjunath N. and V. Lokesha, "Rainbow Chromatic Topological Indicesc of Central Graphs of some Graphs", Palestine Journal of Mathematics.
4. **Glory C** and Manjunath Nanjappa, "QSPR Analysis on Octane Isomers using Degree-based Topological Indices", Applied Mathematics E-Notes