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Notice for the PhD Viva Voce Examination

Ms Vrinda Mary Mathew (Registration Number: 2071503), 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 Friday, 7 June 2024 at 11.30 am in Room No. 044, Ground Floor, R & D Block, CHRIST (Deemed to be University), Bengaluru - 560029.

Title of the Thesis	:	**Graphs Emerging from Finite Dimensional Vector Spaces**
Discipline	:	**Mathematics**
External Examiner (Outside Karnataka)	:	**Dr Narendra P Shrimal** Associate Professor Department of Mathematics Gujarat University Navarangpura, Ahmedabad Gujarat-380009
External Examiner (Within Karnataka)	:	**Dr Girish V R** Associate Professor Department of Mathematics PES University Electronic City Campus Bengaluru - 560100 Karnataka
Supervisor	:	**Dr Sudev N K** Associate 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: 3 June 2024

ABSTRACT

The non-zero component graph of a finite-dimensional vector space over a finite field is a graph where vertices represent all possible non-zero vectors in the vector space. Vertices in the graph are made adjacent if they share a common basis vector in their linear combination. The thesis meticulously explores a variety of structural and parametric properties, encompassing aspects such as distances, domination, connectivity, and forbidden structures. Furthermore, it conducts in-depth analyses of coloring, color connections, topological indices, and centrality-based sensitivity specifically for non-zero component graphs.

The introduction of the concept of orthogonality among vectors in the vector space paves the way for a novel algebraic graph structure—the orthogonal component graph. In this graph, vertices represent all possible non-zero vectors in the vector space, and adjacent vertices correspond to orthogonal vectors. The thesis extends its investigation to delve into structural and parametric properties, particularly in the context of the field Z_p. Additionally, it characterizes the relationship between non-zero component graphs and orthogonal component graphs. In the concluding sections, the concept of non-zero component signed graphs is introduced and thoroughly discussed.

Keywords: Non-zero component graph, connectivity, domination, coloring, color connections, topological indices, centrality measures, sensitivity analysis, entropy, orthogonal component graph, non-zero component signed graph.

Publications:

1. V M Mathew and S Naduvath, ``Some New Results on Non-zero Component Graphs of Vector Spaces over Finite Fields", in *Data Science and Security*, Lecture Notes in Networks and Systems, Springer, 2021.
2. V M Mathew, S Naduvath and T V Joseph, ``New results on Orthogonal Component Graphs of Vector Spaces over Zp", in Communications in Combinatorics and Optimization, 2023. (online)