Notice for the PhD Viva Voce Examination

Mr John Joy (Registration Number: 1942070), PhD scholar at the School of Sciences, CHRIST (Deemed to be University), Bangalore will defend his PhD thesis at the public viva-voce examination on Monday, 17 April 2023 at 10.30 am in the Syndicate Room, (Room No. 802), Ground Floor, Auditorium Block, CHRIST (Deemed to be University), Bengaluru - 560029.

Title of the Thesis	:	**A Study on Restrained Geodetic Domination in Graphs**
Discipline	:	**Mathematics**
External Examiner (Outside Karnataka)	:	**Dr M Yamuna** Associate Professor Department of Mathematics Vellore Institute of Technology Katpadi, Vellore - 632014 Tamil Nadu, India
External Examiner (Within Karnataka)	:	**Dr B Sooryanarayanan** Professor Department of Mathematics Ambedkar Institute of Technology Marathahalli Bengaluru - 560056 Karnataka
Supervisor	:	**Dr Sangeetha Shathish** 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.

Place: Bengaluru

Date: 05 April 2023

Registrar

ABSTRACT

In a graph G = (V,E), the shortest path between any two vertices u and v in G is u − v geodesic. This distance concept leads to the introduction of geodetic set and geodetic number which has wide applications in location theory and convexity theory. A vertex subset S of a graph G is said to be a geodetic set, if all vertex in G is in u−v geodesic for some pair of vertices u and v in S. The minimum cardinality of such a set is the geodetic number and is denoted as g(G). A vertex subset M of a graph G is said to be a dominating set of G if for all vertex v ∈ V (G), either v ∈ M or v is adjacent to a vertex in M. The minimum cardinality of such a set is the domination number and is denoted by γ(G). In general, the geodetic set and the dominating set of a graph need not be the same. This led to the study of the geodetic dominating set. If a geodetic set S is a dominating set of a graph G, then S is called a geodetic dominating set. The minimum cardinality of such a set is the geodetic domination number, which is represented by γg(G).

There are several studies done on the geodetic and domination concepts so far. In the present study, we have explored the concept of restrained geodetic domination and its structural properties in graphs particularly in product graphs and derived graphs. A vertex subset S of a graph G = (V,E) is called a restrained geodetic dominating set if S is a geodetic dominating set of G and < V − S > has no isolated vertex. The minimum cardinality of such a set is called restrained geodetic domination number, which is denoted by γgr(G). We have studied this concept for different classes of graphs and concerning the graph operations such as Cartesian product, corona product, and join of graphs. Further, the study is extended to restrained geodetic domination in derived graphs such as edge subdivision graph, line graph and power of a graph. Also, investigated the properties of graphs with the restrained geodetic domination number equal to the order of the graph. Motivated from the study of domination polynomial and geodetic domination polynomial, the study on restrained geodetic domination polynomial is initiated. While studying the criticality concept in graphs, the concepts of p-geodetic vertex critical graphs, p-geodetic dominating vertex critical graphs and p- restrained geodetic dominating vertex critical graphs are introduced and studied the structural properties of such graphs.

Publications:
1. **J. J. Mulloor** and V. Sangeetha, "Restrained geodetic domination in graphs", Discrete Math. Algorithms Appl., vol. 12, no. 06, pp. 2050084, 2020.
2. **J. J. Mulloor** and V. Sangeetha, "Restrained geodetic domination of edge subdivision graph,", Discrete Math. Algorithms Appl., vol. 14, no. 05, pp. 2250002, 2022.
3. **J. J. Mulloor** and V. Sangeetha, "p-Geodetic vertex critical graphs", J. Rajasthan Acad. Phys. Sci., ISSN: 0972-6306, International Conference on Mathematical and Statistical Computation (ICMSC-2022) Swami Keshvanand Institute of Technology (SKIT), Jaipur, Rajasthan, India, 2022, 57-70.