Executive Summary of the Report of the
Minor Project
entitled
Distance Compatible Set Labeling of Graphs and Structure Knowledge
(No. MRP(S) -888/10-11/KLKA020/UGC-SWRO)

Distance compatible set-labeling (dcsl) of a graph G is an injective set-assignment $f : V(G) \to 2^X$, X a nonempty ground set, such that the corresponding induced function $f^{\oplus} : V(G) \times V(G) \to 2^X - \emptyset$, defined by $f^{\oplus}(uv) = f(u) \oplus f(v)$ satisfies $\mid f^{\oplus}(uv) \mid = k^f_{(u,v)} d(u, v)$ for all distinct $u, v \in V(G)$, where $d(u, v)$ is the distance between u and v and $k^f_{(u,v)}$ is a constant. We define the dcsl index δ_d of graph G as the minimum cardinality of the ground set X such that G admits a dcsl. A dcsl f of a (p, q)-graph G is *dispersive* if the constants of proportionality k^f_{uv} with respect to f, $u \neq v$, $u, v \in V(G)$ are all distinct and G is *dispersible* if it admits a dispersive dcsl. A dispersive dcsl f of G is (k, r)-*arithmetic*, if the constants of proportionality with respect to f can be arranged in the arithmetic progression, $k, k + r, k + 2r, \ldots, k + (q - 1)r$ and if G admits such a dcsl then G is a (k, r)-*arithmetic dcsl-graph*. A dcsl f of G is k-*uniform* if all the constants of proportionality with respect to f are equal to k, and if G admits such a dcsl then, G is called a k-*uniform dcsl-graph*. A graph G is called a l_1-*graph*, if its path metric d_G is isometrically l_1-embeddable. Similarly, a graph G is called a *hypercube embeddable graph*, if its path metric d_G is isometrically hypercube-embeddable. This project is a study on relationship between k-uniform dcsl graphs and minimum λ -scale embeddable graphs. The invesitgar also deals with the complexity in determining the isometric dimension (dcsl-index) of a graph G.
It is established that k-uniform dcsl is a 'k-scale embedding' of G into a hypercube. In the spirit of the notion of 'partial half-cube graphs' the investigator make an attempt to extend the notion of half-cube to that of 'k-fractional cube' $\frac{1}{k}Q_n$ in an obvious way and define partial k-fractional cube graphs as those that are isometrically embeddable into $\frac{1}{k}Q_n$. Their characterizations for different values of k will be worth finding.

Following are the two papers accepted for publication supported from the Project is acknowledged

1. $k-$Uniform Distance Compatible Set-labelled Graphs and l_1-graphs, Proceedings, FIM, Conference Proceedings Statistics 2011 Canada/IMST 2011-FIM XX, Accepted (2011).
2. Uniform distance-compatible set-labelings of graphs, Journal Combinatorial Information System Sciences (JCISS), Accepted (2012)

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