Abstract No: 130 ***ICT, Mathematics, and Statistics***

CORDIAL LABELLING OF PENDANT GRAPHS

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Graph theory is a significant area of discrete mathematics, exploring the relationships and structures formed by vertices and edges. One important concept within graph theory is graph labelling, where labels are assigned to vertices or edges based on specific rules. Cordial labelling is a type of graph labelling characterised by its balanced nature and diverse applications, including network design, coding theory, and communication systems. In cordial labelling, each vertex of a graph is assigned a label from the set $\{0, 1\}$ such that the number of vertices labelled 0 and 1 differ by at most one. Each edge is then labelled according to the absolute difference between the labels of its endpoints, ensuring that the number of edges labelled 0 and 1 also differ by at most one. This research addressed the problem of determining whether pendent graphs admit cordial labelling. Pendant graphs, characterised by having one or more vertices of degree one, are commonly found in various real-world networks. The primary contribution of the present study is a proof of the fact that every pendant graph is cordial. This result shows that pendant graphs inherently allow cordial labelling, enhancing theoretical understanding of graph labelling and offering practical insights for designing balanced network structures. The finding also suggests potential directions for future research, such as extending the result to more complex graph families and exploring further applications of cordial labelling.

Keywords: Balanced network structures, Cordial labelling, Pendant graphs