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GRACEFULNESS IN THE PATH UNION OF VERTEX SWITCHING OF EVEN CYCLES IN INCREASING ORDER

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Abstract: A *graceful labeling* of a graph G with q edges is an injection $f : V(G) \to \{0, 1, 2, ..., q\}$ with the property that the resulting edge labels are also distinct, where an edge incident with the vertices u and v is assigned the label $|f(u) - f(v)|$. A graph which admits a graceful labeling is called a graceful graph. In this paper, we prove that the path union of vertex switching of even cycles in increasing order is graceful.

Keywords and Phrases: Graceful labeling, vertex switching, Path union of graphs.

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1. Introduction

The most famous and challenging graph labeling method is the graceful labeling of graphs introduced by Rosa [9] in 1967. A *graceful labeling* of a graph G with q edges is an injection $f : V(G) \to \{0, 1, 2, ..., q\}$ with the property that the resulting edge labels are also distinct, where an edge incident with the vertices u and v is assigned the label $|f(u) - f(v)|$. A graph which admits a graceful labeling is called a *graceful graph*. A variety of graphs and families of graphs are known to be graceful for the past five decades. Caterpillars are proved to be graceful by Rosa [9]. Morgan [8] has shown that all lobsters with perfect matchings are graceful. Hrnciar and Haviar [6] have shown that all trees of diameter five are graceful.