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LINEAR AND CYCLIC NODE ARRANGEMENT OF CARTESIAN PRODUCT OF CERTAIN GRAPHS

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Abstract: The linear node arrangement of a graph G on n nodes is the embedding of the nodes of the graph onto the line topology L in such a way that the sum of the distance between adjacent nodes in G is optimized. The cyclic node arrangement is the embedding of the nodes of G onto a cycle C in such a way that the optimization is preserved. In this paper we obtain general results to compute the cyclic and linear node arrangement of a class of Cartesian product graphs with C_k and P_k respectively, where C_k, $k \geq 2$, is a cycle on k nodes and P_k is a path on k nodes and their conditional edge faulty graphs.

Keywords and Phrases: Embedding, optimal ordering, edge faulty graph.

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1. Introduction

Let $G = (V_G, E_G)$ be an undirected arbitrary graph with node set $V_G = \{1, 2, \ldots, n\}$. The linear arrangement of G is a bijective mapping λ from V_G to V_L. The cost of a linear arrangement λ is given by

$$LA_\lambda(G) = \sum_{(u,v)\in E_G} |\lambda(u) - \lambda(v)|$$

The linear node arrangement problem is to nd a λ such that $LA_\lambda(G)$ is minimized. The minimum thus obtained is called linear node arrangement of G and is denoted by $LA(G)$ [1]. The cyclic arrangement of G is a bijective mapping λ from V_G to V_C. The cost of a cyclic arrangement λ is given by

$$CA_\lambda(G) = \sum_{(u,v)\in E_G} |\lambda(u) - \lambda(v)|.$$