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SIGMA COLORING AND GRAPH OPERATIONS

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Abstract: The Sigma coloring of a graph G is an assignment of natural numbers to the vertices of G such that the color sums (the sum of the colors of the adjacent vertices) of any two adjacent vertices are different. The Sigma Chromatic number of a graph G, $\sigma(G)$, is the least number of colors used in a sigma coloring of G. In this paper, we investigate the sigma coloring and Sigma Chromatic number of some graph operations such as Tensor product of graphs, Ring sum of graphs and Joint-sum of graphs. We also obtain the sigma coloring and Sigma Chromatic number of some special graphs such as the graphs obtained by duplicating an arbitrary vertex and an arbitrary edge in cycle graphs, C_n, fusion of two vertices in cycle graphs, C_n, two copies of cycle graphs sharing a common edge.

Keywords and Phrases: $\sigma-$coloring, Sigma Chromatic number, Tensor-Product, Ring-Sum, Joint-Sum.

2020 Mathematics Subject Classification: 05C15.

1. Introduction

By a graph, we mean a finite undirected graph without loops or parallel edges. For the terms and notations not defined explicitly here, reader may refer Harary [3]. Graph coloring take a major part in Graph Theory since the rise of the famous four color conjecture. A coloring of a graph G is an assignment of colors to the vertices of G such that adjacent vertices have distinct colors. We represent the colors by natural numbers so that the function $c : V(G) \to N$ is a vertex coloring