16 Distance Magic and Distance Antimagic Labeling of Some Product Graphs

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Let $G=(V,E)$ be a graph of order n. Let $f:V(G)\to\{1,2,\ldots,n\}$ be a bijection. For any vertex $q\in V(G)$, the sum $\sum_{p\in N(q)} f(p)$ is called the weight of the vertex q and is denoted by $w(q)$. If there exists a positive integer γ such that $w(q)=\gamma$, for every $q\in V(G)$, then f is called a distance magic labeling. The constant γ is called the magic constant for f. A graph which admits a distance magic labeling is called a distance magic graph. If $w(q)\neq w(r)$ for any two distinct vertices q and r, then f is called a distance antimagic labeling. A graph which admits a distance antimagic labeling is called a distance antimagic graph. In this chapter, we discuss the existence of distance magic labeling and distance antimagic labeling for $C_3^t\,\square\, C_4$, $C_3^t\times C_4$, $C_3^t\boxtimes C_4$ and $C_4\odot C_3^t$.

16.1 INTRODUCTION

Here, we consider that all graphs G with vertex set $V(G)$ and edge set $E(G)$ are finite and simple. We adopt Gross and Yellen [5] for various graphs and its theoretic notations and for number theoretical results, we follow Burton [3]. For acquiring the latest update, we follow a dynamic survey on graph labeling by Gallian [4].

A *distance magic labeling* of a graph G of order n is a bijection $f:V(G)\to\{1,2,\ldots,n\}$ such that $\sum_{p\in N(q)} f(p)=\gamma$, for all $q\in V(G)$, where $N(q)$ is the set