13 Gaussian Vertex Prime Labeling of Some Graphs Obtained from Origami Models

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A graph with edge set E has a Gaussian vertex prime labeling if its edges can be labeled with first $|E|$ Gaussian integers $\gamma_1, \gamma_2, \ldots, \gamma_{|E|}$ such that for each vertex of degree at least 2 the greatest common divisor of the labels on its incident edges is unit. A graph which admits Gaussian vertex prime labeling is known as a Gaussian vertex prime graph. In this chapter, we investigate Gaussian vertex prime labeling for a boreale star graph, holiday star graph, kusudama flower graph, christmas star graph, braided star graph, and cherry blossom graph.

13.1 INTRODUCTION

We consider here only undirected, connected and simple graph $G = (V(G), E(G))$ with the vertex set $V(G)$ and edge set $E(G)$. For various graph theoretic notations and terminology we follow Gross and Yellen [4] and D. M. Burton[1] for number theoretic results.

The notion of a prime labeling originated with Roger Entringer and was introduced in a paper by Tout et al.[12]. Many researchers have studied prime labeling for a good number of graphs listed in [3].

In [2, 5], Hunter Lehmann et al. defined a beautiful ordering in Gaussian integers and named it as "spiral ordering in Gaussian integers". Motivated by prime labeling they introduced Gaussian prime labeling of graphs with