A SURVEY ON RECENT OPEN PROBLEMS ON SUPER (a,d)-EDGE ANTIMAGIC TOTAL LABELINGS OF GRAPHS

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Abstract

In this article we present some open problems on super \((a, d)\)-edge antimagic total labelings of graphs.

1 Introduction

Throughout this paper \(G = (V, E)\) is a finite undirected graph with neither loops nor multiple edges. The order and size of \(G\) are denoted by \(p\) and \(q\) respectively. For graph theoretic terminology we refer to Chartrand and Lesniak [11].

A labeling of a graph \(G\) is a mapping that assigns integers to the vertices or edges or both, subject to certain conditions. The labeling is called a vertex labeling or an edge labeling or a total labeling according to whether the domain of the mapping is \(V(G)\) or \(E(G)\) or \(V(G) \cup E(G)\). If \(f\) is a total labeling, then the weight of an edge \(uv\) is defined by \(w(uv) = f(u) + f(v) + f(uv)\). For an excellent and up to date dynamic survey on graph labeling we refer to Gallian [13].

An \((a, d)\)-edge-antimagic total labeling of a \((p, q)\)-graph \(G\) is bijection \(f : V \cup E \rightarrow \{1, 2, 3, \ldots, p + q\}\) with the property that the edge-weights form an arithmetic progression \(a, a + d, \ldots, a + (q - 1)d\), where \(a > 0\) and \(d \geq 0\) are two fixed integers. If such a labeling exists, then \(G\) is called an \((a, d)\)-edge-antimagic total graph. If further the vertex labels are the integers \(\{1, 2, 3, \ldots, p\}\), then \(f\) is called a super \((a, d)\)-edge-antimagic total labeling of \(G\) \(((a, d)\)-SEAMT labeling) and a graph which admits such a labeling is called a super \((a, d)\)-edge-antimagic total graph. This labeling was first introduced by Simanjuntak et. al. [25].

2 Friendship Graphs

The graph \(F_n\) consisting of \(n\) triangles with a common vertex is called the friendship graph.

Several authors have investigated the existence of a \((a, d)\)-SEAMT labeling of the friendship graph \(F_n\). Slamin et. al. [26] showed that the friendship graph \(F_n\) has a \((a, 0)\)-SEAMT labeling if and only if \(n \in \{1, 3, 4, 5, 7\}\). Bača et. al. [6] showed that for \(n \in \{1, 3, 4, 5, 7\}\), the friendship graph \(F_n\) has \((a, 0)\)-SEAMT labeling and \((a, 2)\)-SEAMT labeling. For the friendship graph the following problem is posed in [7] and [4].