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Power-3 Heronian odd Mean Labeling of Graphs

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Abstract: In this article, we discuss Power-3 Heronian odd Mean Labeling for some families of graphs.A function is said to be Power-3 Heronian odd mean labeling of a graph G with q edges, if f is a bijective function from the vertices of G to the set{1,3,5,.......2p-1}such that when each edges uv is assigned the label.
The resulting edge labels are distinct numbers.

$$\beta^*(e = uv) = \left\lfloor \sqrt[3]{\frac{\beta(u)^3 + \left(\beta(u)\beta(v)\right)^{\frac{3}{2}} + \beta(v)^3}{3}} \right\rfloor$$

Keywords: Mean labeling, multiplicative labeling, Additive labeling.

I. INTRODUCTION

In this paper, the graphs are taken as simple, finite and undirected. V(G) represents the vertex set and E(G) represents Edge set. A graph labeling is an assignment of integers to its vertices or edges subject to some certain conditions. A vertex labeling is a function of V to a set of labels. A graph with such a vertex labeling function is defined as Vertex – labeled graph.An edge labeling is a function of E to a set of labels and a graph with such a function is called an edge labeled graph. In this article path,triangular snake,caterpillar are discussed Power-3 Heronian odd Mean Labeling Of Graphs.

All Graphs in this paper are finite and undirected. The symbols V(G) and E(G) denote the vertex set and edge set of a graph G. The cardinality of the vertex set is called the order of G denoted by p. The cardinality of the edge set is called the size of G denoted by q edges is called a (p,q) graph. A graph labeling is an assignment of integers to the vertices or edges. Bloom and Hsu[2] extended the notion of graceful labeling to directed graphs. Graceful signed graphs f(uv) is the difference between f(v) and f(v), that is f(uv) = f(v) – f(u). Shalini, Paul Dhayabaran [14] introduced the concept A Study on Root Mean Square Labelings in Graphs. Shalini, Paul Dhayabaran [13] defined An Absolute Differences of Cubic and Square Difference Labeling. Shalini, Gowri, Paul Dhayabaran [15] discussed An Absolute Differences of Cubic and Square Difference Labeling For Some Families of Graphs. Shalini, Sri Harini, Paul Dhayabaran [19] introduced Sum of an Absolute Differences of Cubic And Square Difference Labeling For Cycle Related Graphs. Shalini, Gowri, Paul Dhayabaran [16] studied An Absolute Differences of Cubic and Square Difference Labeling for Some Shadow and Planar Graphs. Shalini, Subha, Paul Dhayabaran [20] investigated A Study on Disconnected Graphs for an Absolute Difference Labeling. Shalini, Subha, Paul Dhayabaran [22] discussed A Study on Disconnected Graphs for Sum of an Absolute Difference of Cubic and Square Difference Labeling. Shalini, Sri Harini, Paul Dhayabaran [21] extended Sum of an Absolute Differences of Cubic And Square Difference Labeling For Path Related Graphs. Shalini.P, S.A.Meena[25] introduced “Lehmer -4 mean labelling of graphs”.

II. BASIC DEFINITIONS

1) Definition 2.1

In graph theory, **a path** in a graph is a finite or infinite sequence of edges which joins a sequence of vertices which, by most definitions, are all distinct (and since the vertices are distinct, so are the edges)

2) Definition 2.2

Caterpillar is attained by removing the pendant vertices of a path from the tree. It has vertices and edges.

3) Definition 2.3

A Triangular snake T_m is attained by attaching every pair of vertices of a path to another new vertex. (i,e.,) we can replace each edge of a path P_n by a cyclic graph C_3.Generally, it has vertices and edges.

4) Definition 2.4

A graph G is said to be power-3 Heroine odd Mean Labeling graph, if it admits power-3 Heroine odd Mean labeling.

III. MAIN RESULTS

1) Theorem:3.1

The path is a Power-3 Heronian odd Mean Labeling for n≥2.

Proof: Let G be a graph of path p_n.

The path p_n consists of n vertices and n-1 edges. The vertices of p_n are labeled as given below.

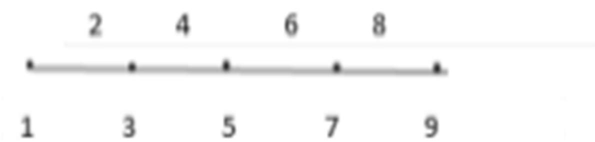

Figure 3.1: Path p_5

Define β: V(G) → {1,3,5,7,..........2n-1} by,

$f(v_i)=2i-1$; $1\leq i\leq n$

Then the edge labels as $f(e_i)=2i$; $1\leq i\leq n$

Therefore p_n is said to be power-3 Heronian odd Mean graph.

2) Theorem: 3.2

The Triangular snake T_n a Power-3 Heronian Mean graph for n ≥3.

Proof:

Let G be a graph of T_n

Generally ,T_n consists of 2n-1 vertices.

Now, defining a function β:V(G) {1,3,5,........n} by,

β (u)= 2i-1, where i=1,2,3,4..........n

β (v)=4i-1 , where i=1,2,3,4...........n

Then the induced edge labels are given by,

β (e_i)= 2i, where i=1,2,3,4.........n β (e_i)=4i-1, where i=1,2,3,4.........n

The edges receives weight as distinct integers.Therefore, it is said to be a Power-3 Heronian odd Mean labeling graph.

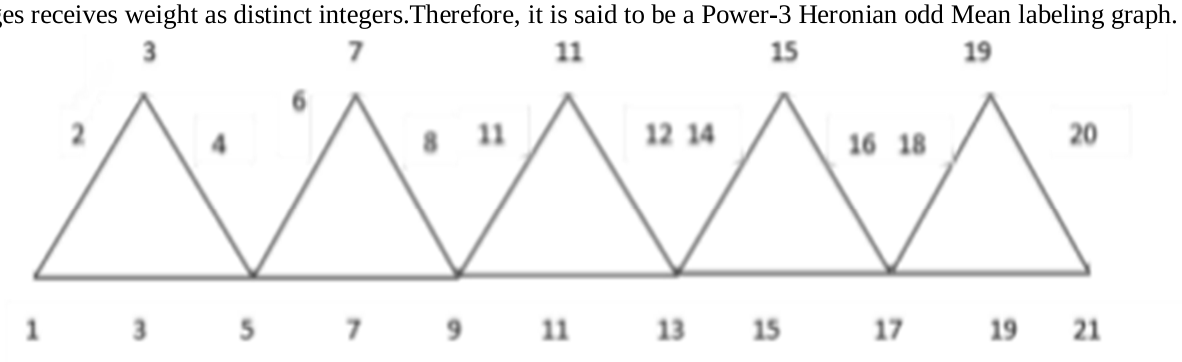

Figure 3.2:Triangular snake T_5

3) Theorem:3.3

The caterpillar $CP_n$is a Power-3 Heronian Mean Labeling Graph for n≥2.

Proof:

Then the induced edge labels are given by,

$\beta^*(v_iv_i)=6i-1$, where i=1,2,3,4,......n

$\beta^*(v_iu_i)$=6i+1, where i=1,2,3,4,......n Assume G be a graph attained by joining a single edge to the two sides of each vertex of . Let be a path Pn.Let Pn be a path $_{V1,}$ .Let ui and wi be the pendant vertices adjacent to vi.Generally, it has 3n vertices and 3 n-1 edges

Now, defining a function by β:V(G) → {1,3,5,.........n}

$\beta(u_i)$= 6i-5, where i=1,2,3,4..........n $\beta(v_i)$=6i-3, where i=1,2,3,4,............n $\beta(w_i)$=6i-1, where i=1,2,3,4...........n $\beta(v_iw_i)$=6i-1, where i=1,2,3,4,........n

The edge receives weight as a distinct integers.Therefore, it is said to be a Power-3 Heronian odd Mean graph

Figure 3.3: Caterpillar CP_n

IV. CONCLUSION

In this article, we proved some families of graphs which admits Power-3 Heronian odd Mean Labeling .Therefore, Path, Triangular snake, Caterpillar are Power-3 Heronian Odd Mean Labeling.

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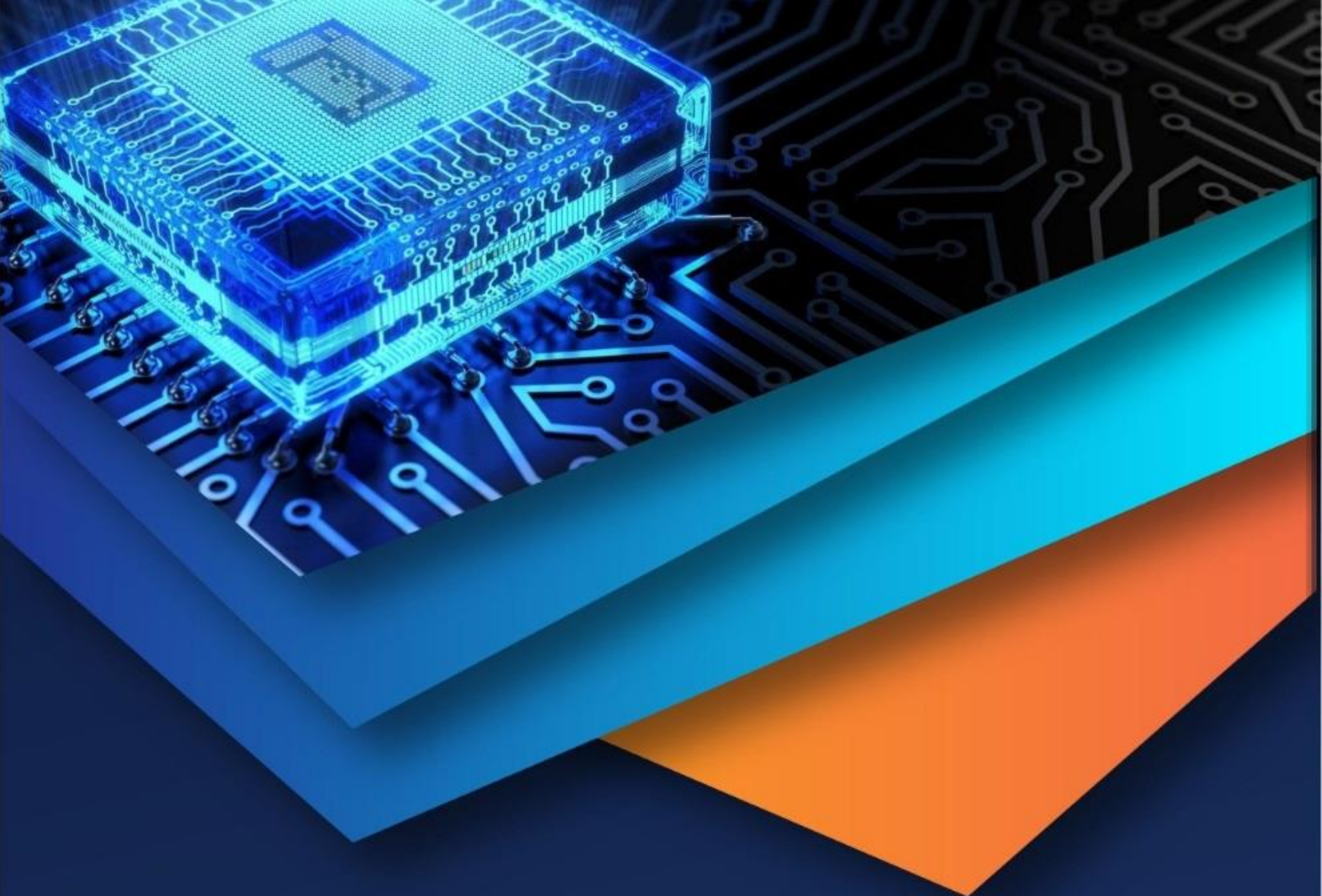

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