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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.

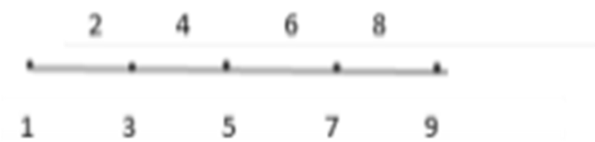

Figure 3.1: Path p_5

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.

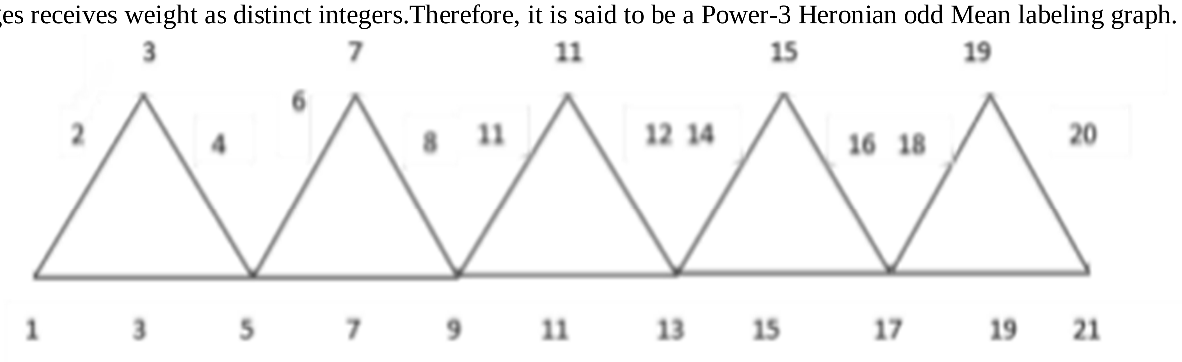

Figure 3.2:Triangular snake T_5

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,

β*(v_iv_i)=6i-1, where i=1,2,3,4,......n

$\beta^*(v_i u_i)=6i+1$, 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 $\beta(v_i w_i)=6i-1$, 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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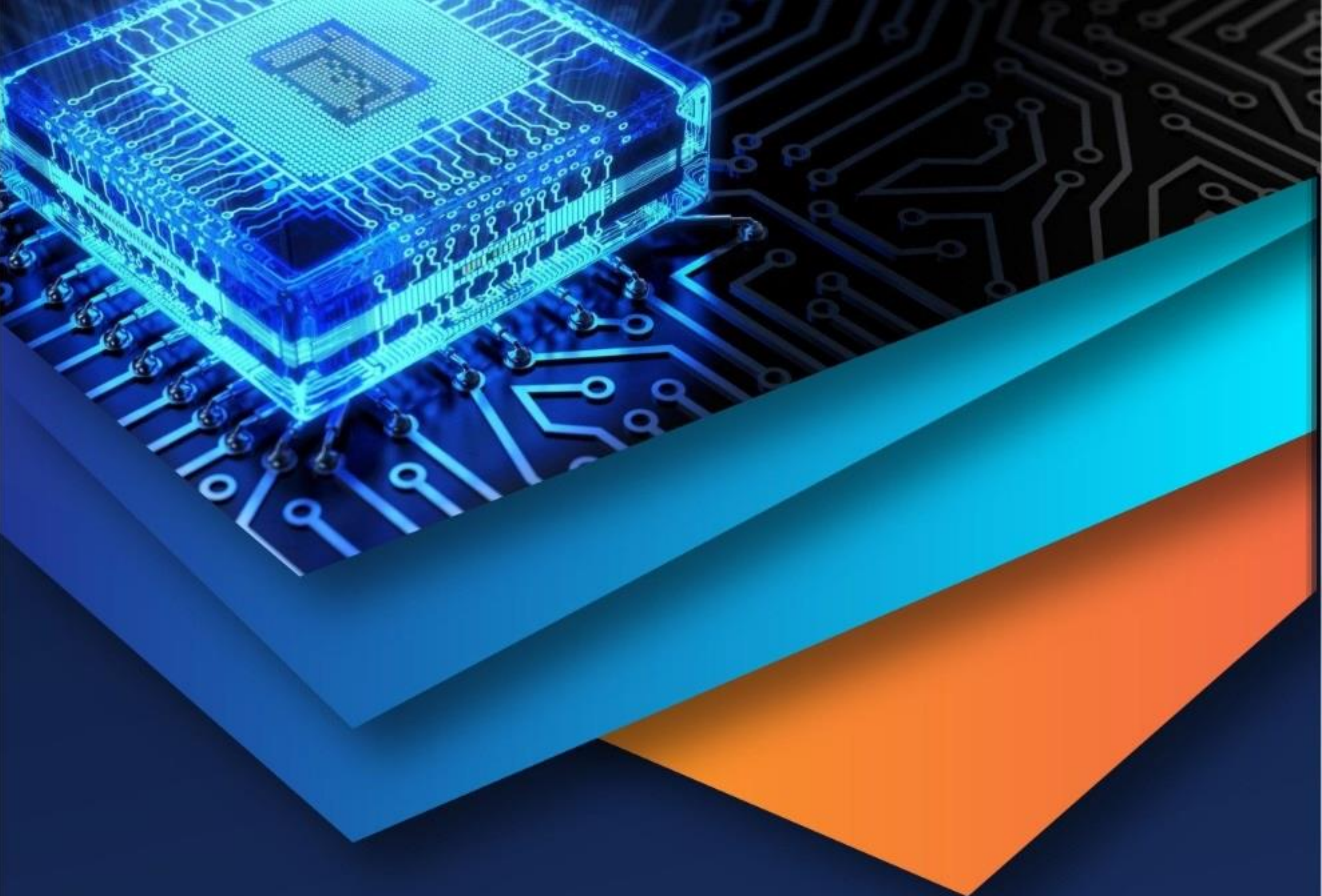

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