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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.

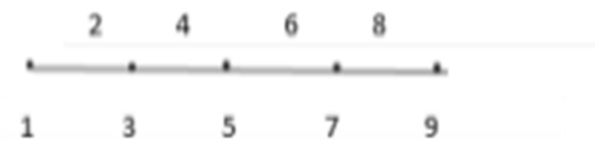


Figure 3.1: Path p_5

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.

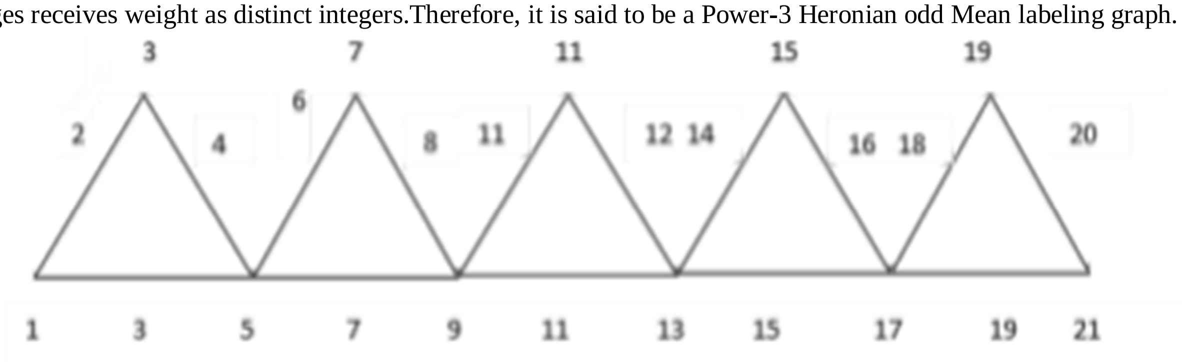


Figure 3.2:Triangular snake T_5

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

$\beta^*(v_i u_i)=6i+1$, 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 $\beta:V(G) \rightarrow \{1,3,5,.........n\}$

$\beta(u_i)= 6i-5$, 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.

REFERENCES

[1] Bodendick, R. and Walther, G., On number theoretical methods in graph labelings Res.Exp. Maths (2,/1995) 3-25.
[2] Bloom, D.F. Hsu, On graceful directed graphs, SIAMJ, Alg. Discrete Math.,6(1985),519-536.
[3] Gallian, M.A., "A Dynamic survey of graph labelings" Electronic journal, 2000 (Volume-23).
[4] Harary, F., Graph Theory, New Delhi: Narosa Publishing House, 2001.
[5] Hedge, S.M., Labeled graphs and Digraphs: Theory and Application.
[6] MacDougall, J.A., Mikra Millar, Slamin and W.D Wallis, Utilitas Math in press.
[7] Murugan, K., Subramanian, A., Skolem Difference Mean Graphs, Mapana, Christ University Journal of Science.
[8] Palanikumar, R, Rameshkumar, A, Wiener Index of Physio-Chemical Labeled Graph, Bulletin of pure and Applied Sciences, Vol. 37E(Math & Stat), No. 2, 2018, PP: 519 – 522.
[9] Palanikumar, R, Rameshkumar, A, T Wiener Index of Fibonacci Labeled Graph $P_n F_4$, Journal of Computer and Mathematical Sciences, Vol. 9(11), 1712 1716,November 2018..
[10] Palanikumar, R, Rameshkumar, A, Labeling on Dragon curve Fractal Graph, Aryabhatta Journal of Mathematics & Informatics, Vol. 10, No. 2, July - Dec 2018.
[11] Rameshkumar, A, Palanikumar, R, The Wiener Lower Sum and Upper Sum of Friendship Graph F_n^r , Journal of Indian Acad. Math, Vol. 37, No. 2(2015), pp. 305– 311.
[12] Rameshkumar, A, Palanikumar, R, Wiener Lower Sum of Complete K_N^R Graph, Aryabhatta Journal of Mathematics & Informatics, Vol. 7, No. 2, July – Dec 2015.
[13] Shalini. P, Paul Dhayabaran. D, An Absolute Differences of Cubic and Square Difference Labeling, International Journal of Advanced Scientific and Technical Research, May-June 2015, Issue-5, Volume-3, pages 1-8.

[14] Shalini. P, Paul Dhayabaran. D, A Study on Root Mean Square Labelings in Graphs, International Journal of Engineering Science and Innovative Technology, May 2015, Volume-4, Issue-3, pages 305-309.

[15] Shalini. P, Gowri. R, Paul Dhayabaran. D,An absolute Differences of Cubic and Square Difference Labeling For Some Families of Graphs, International Journal of Analytical and Experimental Modal Analysis, Vol.11, Issue 10, October 2019, Pages 538 - 544, Impact Factor: 6.3. ISSN No: 0886 - 9367.

[16] Shalini. P, Gowri. R, Paul Dhayabaran. D, An Absolute Differences of Cubic and Square Difference Labeling for Some Shadow and Planar Graphs, The International Journal of Analytical and Experimental Modal Analysis, Volume XII, Issue I, January 2020, Pages 352 – 355.

[17] Shalini. P, Paul Dhayabaran. D, Maximization of Multiplicative Labeling, International Journal of Research in Advent Technology, Special Issue, pages 209-214, January 2019.

[18] Shalini. P, Paul Dhayabaran. D,Minimization of Multiplicative Graphs, International Journal of Current Research, Volume 7, Issue-08,pages 19511-19518,August 2015.

[19] Shalini. P, Sri Harini. S ,Paul Dhayabaran. D,Sum of an Absolute Differences of Cubic And Square Difference Labeling For Cycle Related Graphs, The International Journal of Analytical and Experimental Model Analysis, Volume XII, Issue I, January 2020 , pages 370-374.

[20] Shalini. P, Subha. P, Paul Dhayabaran. D,A Study on Disconnected Graphs for an Absolute Difference Labeling, The International Journal of Analytical and Experimental Modal Analysis, Volume XII, Issue I, January 2020, Pages 415 – 421.

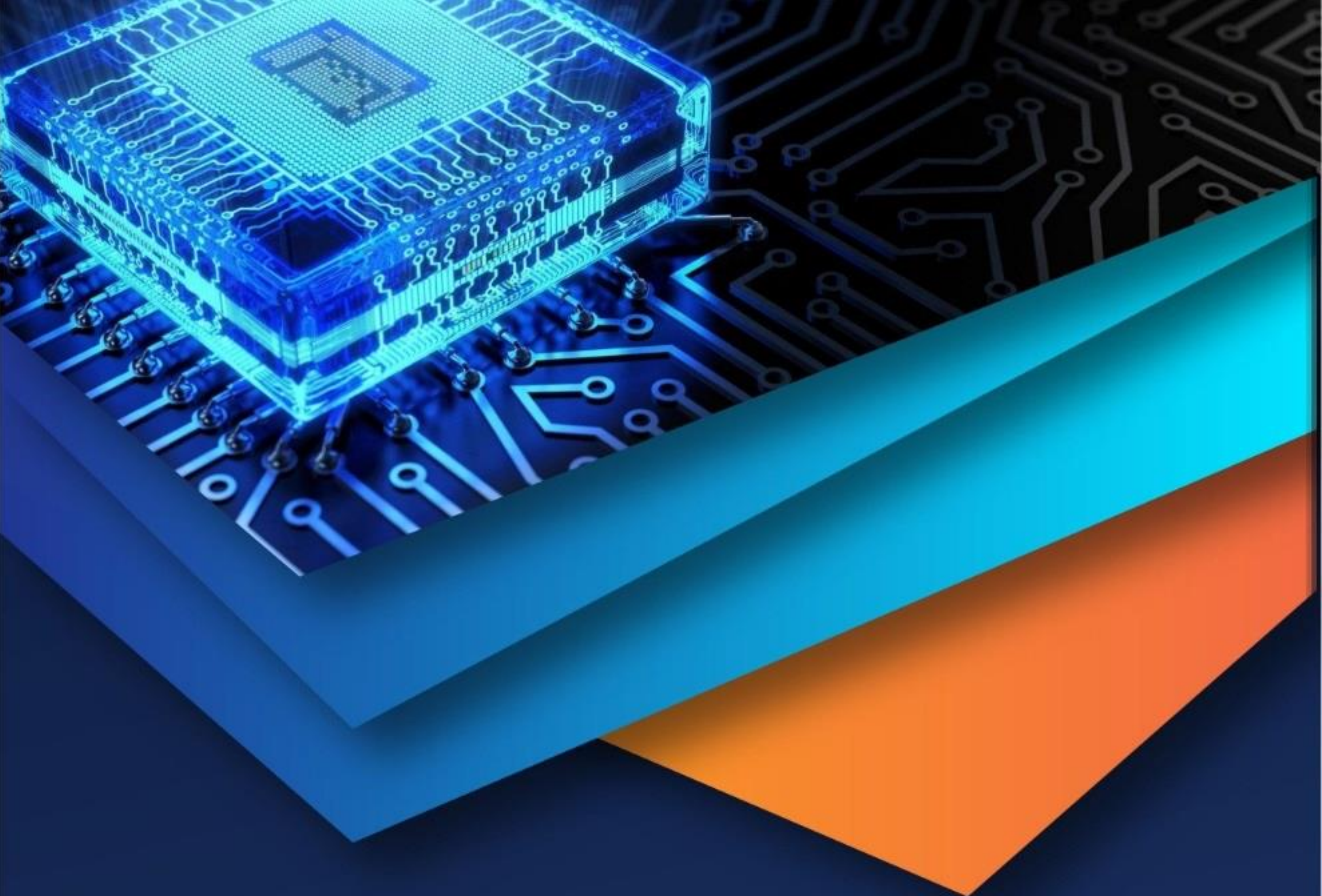
[21] Shalini. P, Sri Harini. S, Paul Dhayabaran. D,Sum of an Absolute Differences of Cubic And Square Difference Labeling For Path Related Graphs, Infokara Research, Volume IX, Issue 2, February 2020, pages 58 - 67 , ISSN NO: 1021 9056.

[22] Shalini. P, Subha. P, Paul Dhayabaran. D,A Study On Disconnected Graphs For Sum of an Absolute Difference of Cubic and Square Difference Labeling, Journal Of Interdisciplinary Cycle Research, Volume XII, Issue II, February 2020, Pages 952 962, ISSN NO: 0022 - 1945.

[23] Shalini. P, Sudar. A, Minimization of Multiplicative labelling for some families of Graphs, Gorteria Journal, Vol 34, Issue 1, 2021, Pg.No: 369 – 376, ISSN No: 0017 2294.

[24] Shalini. P, Sudar. A,Minimization of Multiplicative labelling for Antenna, Dumpy Level Instrument, Net Graphs, International Journal of analytical and experimental modal analysis, Vol XIII, Issue II, February 2021, Pg.No: 343 – 349, ISSN No: 0886- 9367.

[25] Shalini.P, S.A.Meena “Lehmer -4 mean labelling of graphs”, Volume 10, Issue XII, International Journal for Research in Applied Science and Engineering Technology (IJRASET) Page no: 1348-1351,ISSN : 2321-9653.



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