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n-Edge Magic Labeling of Splitting Graphs

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Abstract

In this article, we proposed a few Splitting graphs with accept n -EML. Also, we analyze the few graphs which accepts this n- EML.

Key words: Labeling, Magic labeling, n-Edge Magic Labeling[n-EML],Splitting Graph.

AMS classification: 05C78

1 Introduction

A graph labeling was first introduced by Rosa in 1967,Origin of the zero-edge magic labeling by Jayapriya J and Thirusangu K in 2012(5). one -edge magic labeling was first introduced in 2013(7) by Neelam Kumari and Seema Mehra, n-edge magic labeling was first developed in 2013(8) by Neelam kumari and Seema Mehra, In this article on n-edge magic labelling of a few splitting graphs

Definition 1.1 For each node X about a graph G,holding a recent node X',link X' be entire nodes G adjoining to X. then The graph is splitting Graph G and is mean by $S(G)$.

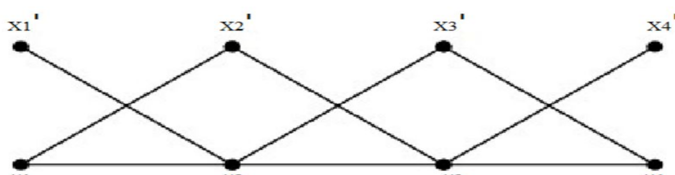

Figure 1: $S(P_4)$

Definition 1.2 :Zero Edge Magic Labeling

A graph G along s nodes and t edges as a operation from the nodes of G to $[-1, 1]$

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s.t every edge xy is determined by the label $o(x)+o(y)=0$. the resulting is called zero edge magic labeling.

Definition 1.3 :One Edge Magic Labeling

A graph G along s nodes and t edges as a operation from the nodes of G to $[-1,2]$ s.t every edge xy is determined by the label $o(x)+o(y)=1$. the resulting is called one edge magic labeling.

Definition 1.4 : n Edge Magic Labeling

A graph G along s nodes and t edges as a operation from the nodes of G to $[-1,n+1]$ s.t every edge xy is determined by the label $o(x)+o(y)=n$. the resulting is called n edge magic labeling.

2 Main Results

Theorem 2.1 $AS(P_z)$ graph acccept $n-EML$ for every z.
proof:
$AS(P_z)$ graph has $2z$ nodes and $3z-3$ edges.
let $X(G)=x_i:1\leq i\leq z$ ∪ss $x_i':1\leq i\leq z$ and
$E(G)=x_i'x_{i+1}:1\leq i\leq z-1\cup x_ix_{i+1}:1\leq i\leq z-1\cup x_i'x_{i-1}:2\leq i\leq z$.
Let $o:X\to[-1,n+1]$ s.t

$$(1)\ o(x_i)=o(x_i')=(-1)^i:1\leq i\leq z \text{ if } i \text{ is odd}$$
$$(2)\ o(x_i)=o(x_i')=n+1:1\leq i\leq z \text{ if } i \text{ is even}$$

The edge loads are estimated as displayed:

$$\text{For } 1\leq i\leq z-1:o(x_i)+o(x_{i+1})=n.$$
$$\text{For } 2\leq i\leq z:o(x_i')+o(x_{i-1})=n.$$
$$\text{For } 1\leq i\leq z-1:o(x_i')+o(x_{i+1})=n.$$

So edges gather cost n.then the $S(P_z)$ graph accept $n-EML$.
n-EML of $S(P_6)$ is displayed in the diagram.

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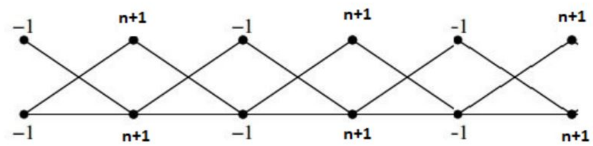

Figure 2: n –EML of $S(P_6)$

Theorem 2.2 A $S(C_Z)$ graph accept $n-EML$ only for z is even.
proof:
A $S(C_Z)$ graph has 2z nodes and 3z edges.
let $X(G) = x_i : 1 \leq i \leq z \cup x_i' : 1 \leq i \leq z$ and
$E(G) = x_i'x_{i+1} : 1 \leq i \leq z-1 \cup x_ix_{i+1} : 1 \leq i \leq z-1 \cup x_i'x_{i-1} : 2 \leq i \leq z \cup x_1x_n, x_n'x_1, x_1'x_n$.
Let $o : X \to [-1, n+1]$ s.t

$$(1)\ o(x_i) = o(x_i') = (-1)^i : 1 \leq i \leq z \text{ if } i \text{ is odd}$$
$$(2)\ o(x_i) = o(x_i') = n+1 : 1 \leq i \leq z \text{ if } i \text{ is even}$$

The edge loads are estimated as displayed:

$$For 1 \leq i \leq z-1 :\ o(x_i) +\ o(x_{i+1}) = n.$$

$$For 2 \leq i \leq z :\ o(x_i^{'}) +\ o(x_{i+1}) = n.$$

$$For 1 \leq i \leq z-1 :\ o(x_i^{'}) +\ o(x_{i+1}) = n.$$

Also

$$o(x_1) +\ o(x_n) = n.$$

$$o(x_n^{'}) +\ o(x_1) = n.$$

$$o(x_1^{'}) +\ o(x_n) = n.$$

So edges gather cost n. Then the $S(C_z)$ graph accept n-EML only for z is even. n-EML of $S(C_6$ is displayed in the diagram.

Theorem 2.3 : A $S(K_1, z)$ graph accept n-EML.
Proof: A $S(K_1, z)$ graph has $2z+2$ nodes and 3z edges.
Let $X(G) = \{x_i : 1 \leq i \leq z+1\} \cup \{x_i^{'} : 1 \leq i \leq z+1\}$ and

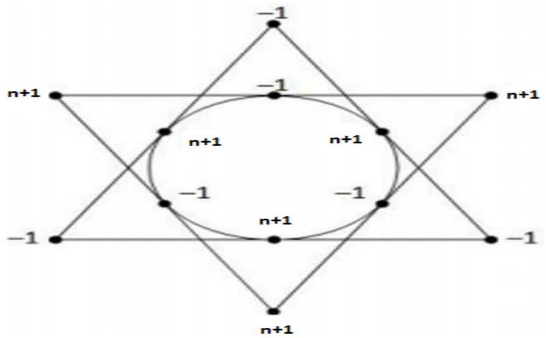

Figure 3: n –EML of $S(C_6)$

$E(G) = \{x_1x_i : 2 \leq i \leq z+1\} \cup \{x_i^{'}x_i : 2 \leq i \leq z+1\} \cup \{x_i^{'}x_1 : 2 \leq i \leq z+1\}$
Let $o : X \longrightarrow [-1, n+1]$ s.t

$$(i)o(x_1) = o(x_1^{'}) = -1$$

$$(ii)o(x_1) = o(x_i^{'}) = n+1 : 2 \leq i \leq z+1$$

The edge loads are estimated as displayed:

$$For\ 2 \leq i \leq z+1 : o(x_1) + o(x_i) = n.$$

$$For\ 2 \leq i \leq z+1 : o(x_1) + o(x_i^{'}) = n.$$

$$o(x_1^{'}) + o(x_i) = n\ if\ i = 2\ and\ i = z+1$$

$$o(x_1^{'}) + o(x_i^{'}) = n\ if\ i = 2\ and\ i = z+1$$

So edges gather cost n. Then the $S(K_{1,z})$ graph accept n-EML.
n-EML of $S(K_{1,4})$ is displayed in the diagram.

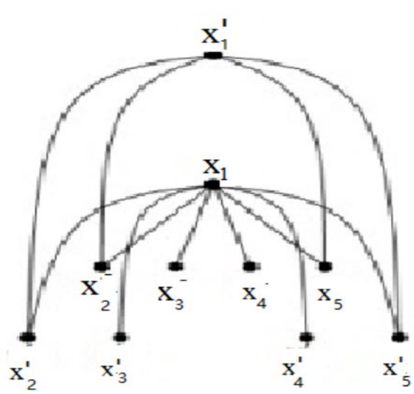

Figure 4: n –EML of $S(K_{1,4})$

Theorem 2.4 A $(B_{y,z})$ graph $y,z \geq 2$ accept $n-EML$.
Proof: A $S(B_{y,z})$ graph has $2y+2z+4$ vetices and $3y+3z+1$ edges.
Let $X(G) = \{x_i, x_i^{'} : 1 \leq i \leq z+1\} \cup \{y_i, y_i^{'} : 1 \leq i \leq y+1\}$ and
$E(G) = \{x_1 x_i : 2 \leq i \leq z+1\} \cup \{y_1 y_i : 2 \leq i \leq y+1\} \cup \{x_1^{'} x_i : 2 \leq i \leq z+1\} \cup \{y_1^{'} y_i^{'} : 2 \leq i \leq y+1\} \cup \{y_1 x_1\} \cup \{y_1 x_1^{'}\} \cup \{y_1^{'} x_1\} \cup \{x_i^{'} x_1 : 2 \leq i \leq z+1\} \cup \{y_i^{'} y_1 : 2 \leq i \leq y+1\}$
Let $o : X \longrightarrow [-1, n+1]$ s.t
(i)$o(y_i) = o(y_i^{'}) = -1$: for $2 \leq i \leq y+1$
(ii)$o(x_i) = o(x_i^{'}) = n+1$: for $2 \leq i \leq z+1$
(iii)$o(y_1^{'}) = o(y_1) = n+1$
(iv)$o(x_1^{'}) = o(x_1) = -1$
The edge loads are estimated as displayed:

$$For\ 2 \leq i \leq z+1 : o(x_1) + o(x_i) = n$$

$$For\ 2 \leq i \leq z+1 : o(x_i^{'}) + o(x_1) = n$$

$$For\ 2 \leq i \leq z+1 : o(x_1^{'}) + o(x_i) = n$$

$$For\ 2 \leq i \leq y+1 : o(y_1) + o(y_i) = n$$

$$For\ 2 \leq i \leq y+1 : o(y_1^{'}) + o(y_i^{'}) = n$$

$$For\ 2 \leq i \leq y+1 : o(y_i^{'}) + o(y_1) = n$$

Also

$$o(y_1) + o(x_1) = n$$

$$o(y_1) + o(x_1^{'}) = n$$

$$o(y_1^{'}) + o(x_1) = n$$

So edges gather cost n. Then the $S(B_{y,z})$ graph accept n -EML.
n -EML of $S(B_{3,4})$ is displayed in the diagram.

Theorem 2.5 Splitting graph of every tree is n -EML.
Proof: Let y be an random vertex in the tree T, such that $deg(y) = k, k > 1$.
Let consider y has k successors $x_1, x_2, \ldots x_k$, location all $x_i^{'}$ s are pendent then by sum a new vertex $y^{'}$ and joining we get $y^{'}x_1, y^{'}x_2, \cdots, y^{'}x_k$, which form $(k-1)C_4$ cycle namely $\{yx_1y^{'}x_2y, yx_2y^{'}x_3y, yx_3y^{'}x_4y, \cdots, yx_{k-1}y^{'}x_ky\}$.
After we include $x_1^{'}, x_2^{'}, \cdots, x_k^{'}$ and join each $y_i^{'}$ to the vertex y.

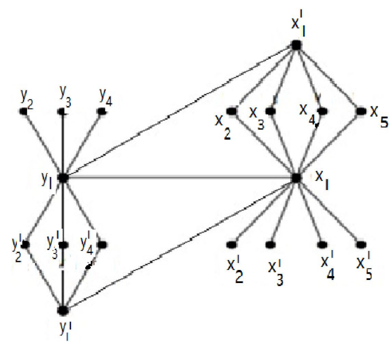

Figure 5: n –EML of $S(B_{3,4})$

we get k - new pendent edge $yx_1', yx_2', \cdots, yx_k'$.
Consider $o(y) = o(y') = n+1$ (say),
then $o(x_i') = o(x_i) = -1$.
So edges loads gather n -EML of S(T) with random vertex is displayed in the diagram.

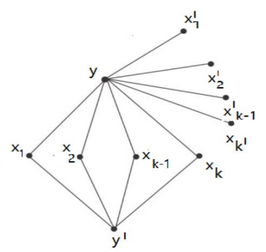

Figure 6: n –EML of $S(T)$ with random Vertex

3 Conclusion

In this article reviewed a few Splitting graphs with accept n -EML. More analysis can be done to attain the educate on that a few graphs accept n -EML.

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