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A STUDY ON ZERO-M CORDIAL LABELING

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ABSTRACT. A labeling $f : E(G) \to \{1, -1\}$ of a graph G is called zero-M-cordial, if for each vertex v, the arithmetic sum of the labels occurrence with it is zero and $|e_f(-1) - e_f(1)| \leq 1$. A graph G is said to be Zero-M-cordial if a Zero-M-cordial label is given. Here the exploration of zero - M cordial labelings for deeds of paths, cycles, wheel and combining two wheel graphs, two Gear graphs, two Helm graphs. Here, also perceived that a zero-M-cordial labeling of a graph need not be a H-cordial labeling.

1. INTRODUCTION

Cogite a finite undirected, simple graph $G = (V(G), E(G))$ with p vertices and q edges, just as you go through this paper. Graph Labeling remains abouncing region be in the right place to research in Graph Theory which consumes an exact perseverance in coding theory, communicate networks and graph putrefaction problems. For all other notations and terms bring up to Bondy and Muthy [2]. J.A.Gallian [1] developed graph labeling which executes as a boundary stuck flanked by number theory and the structure of graphs. The perception of labeling was acquainted by G.S.Bloom and S.Ruiz [3]. Cordial marking is carried out in the form of Graceful and Harmonious Marking, familiarized by Cahit (1987) [4]. Here, the exploration of Zero M cordial Labeling for the deeds of paths, cycles, wheel and combining two Wheel graphs, two Gear graphs, two Helm

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graphs and two Jelly fish graphs. Here, also perceived that a zero-M-cordial labeling of a graph need not be a H-cordial labeling. In the mean time we cannot say that every H-cordial labeling of graphs is a zero-M-cordial labelling.

2. Preliminaries

Definition 2.1. *Let* $f : V(G)$ *to* $\{0, 1\}$ *be there a function. For each edge uv apportion the Labeling* $|f(u) - f(v)|$, f *is known as Cordial Labeling if* $|v_f(i) - v_f(j)| \leq 1$ *and*$|e_f(i) - e_f(j)| \leq 1$ *with* $i, j \in \{0, 1\}$ *, where* $v_f(x)$ *and* $e_f(x)$ *symbolize the number of labelled vertices and edges with* $x(x = 0, 1)$. *A cordial diagram is considered a cordial diagram.*

Definition 2.2. *A mapping* $f : E(G) \to \{1, -1\}$ *is known as H-cordial, if there be existent a positive constant* k*, like for each vertex* v*,* $|f(v)| = k$ *and the resultant two conditions are satisfied,* $|e_f(1) - e_f(-1)| \leq 1$ *and* $|v_f(k) - v_f(-k)| \leq 1$. *If it accepts H-Cordial marking, a graph G will be known as H-Cordial.*

Definition 2.3. *A Graph* G *with* f *labeling is called Zero-M cordial, if each vertex* v *is called* $f(v) = 0$. *A graph* G*, which admits a Zero-M cordial marking, is considered to be cordial.*

3. Main Results on Zero-M Cordial Labeling

Theorem 3.1. *Every* $W_n \times P_2$ *with* n *vertices concedes Zero - M Cordial Labeling.*

Proof. Let consent to G be a Graph of $W_n \times P_2$. Let authorize $V(G) = \{v_1, v_2, \ldots, v_n, v_1^{'}, v_2^{'}, \ldots, v_n^{'}\}$ and $E(G) = \{e_1, e_2, \ldots, e_n, e_1^{'}, e_2^{'}, \ldots, e_n^{'}\}$ with $V(G) = n$ and $E(G) = n + (n/2 + 3)$. Now edges can be stated as,

$$\begin{aligned} E(G) = &\{v_1 v_i / 2 \leq i \leq n/2\} \cup \{v_{n/2} v_{n/2-3}\} \cup \{v_i v_{i+1} / 2 \leq i \leq n/2 - 1\} \\ &\cup \{v_1^{'} v_i^{'} / 2 \leq i \leq n/2\} \cup \{v_i^{'} v_{i+1}^{'} / 2 \leq i \leq n/2 - 1\} \\ &\cup \{v_{n/2}^{'} v_{n/-3}^{'}\} \cup \{v_i v_i^{'} / i = 2n + 1\}. \end{aligned}$$

At this instant, delineate a function $f : E(G) \to \{1, -1\}$ by

$$f(v_1 v_i) = \begin{cases} 1, & \text{if} \quad i \equiv 1(\text{mod} 2) \\ -1, & \text{if} \quad i \equiv 0(\text{mod} 2) \end{cases}, \text{ where } 2 \leq i \leq n/2$$

$$f(v_i v_{i+1}) = \begin{cases} 1, & \text{if} \quad i \equiv 1(\text{mod} 2) \\ -1, & \text{if} \quad i \equiv 0(\text{mod} 2) \end{cases}, \text{ where } 2 \leq i \leq n/2.$$

$$f\left(v_{n/2}v_{n/2-3}\right)=\begin{cases}1, & \text{if } n\equiv 0(\text{mod}2)\\ -1, & \text{if } n\equiv 1(\text{mod}2)\end{cases}$$

$$f\left(v_1^{'}v_i^{'}\right)=\begin{cases}1, & \text{if } \ i\equiv 1(\text{mod}2)\\ -1, & \text{if } \ i\equiv 0(\text{mod}2)\end{cases} \text{ where } 2\leq i\leq n/2$$

$$f\left(v_i^{'}v_{i+1}^{'}\right)=\begin{cases}1, & \text{if } i\equiv 1(\text{mod}2)\\ -1, & \text{if } i\equiv 0(\text{mod}2)\end{cases} \text{ where } 2\leq i\leq n/2$$

$$f\left(v_{n/2}^{'}v_{n/2-3}^{'}\right)=\begin{cases}1, & \text{if } n\equiv 0(\text{mod}2)\\ -1, & \text{if } n\equiv 1(\text{mod}2)\end{cases}$$

$f\left(v_iv_i\right)=\pm 1 \quad$ Where $i=2n+1$.

The entire number of labelled edges is calculated by 1 and -1 are specified by $e_f(-1)=n$ and $e_f(1)=n$. Accordingly, in addition to each vertex $v, f(v)=0$ in addition to $|e_f(1)-e_f(-1)|\leq 1$. Hence, $W_n\times P_2$ concedes Zero -M-Cordial Labeling. □

Illustration 3.1: Zero - M Figure 1 represents the Cordial Labeling of the graph $W_{10}\times P_2$.

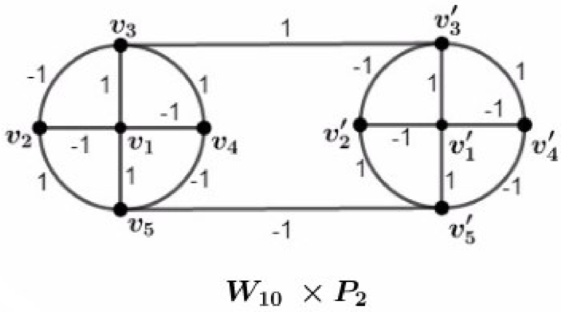


FIGURE 1

Remark 3.1. *Every $W_n\times P_2$ with n vertices concedes Zero $-M$ Cordial Labeling but not a H-coralial labeling.*

Proof. In this case, 9 edges of the 18 edges are labeled with+1 and 9 edges are labelled with 1.

Consider the graph $W_n\times P_2$ with odd vertices, we generate the vertex labels as 2 and -2. If a positive constant k exists, a label of a graph G is called H

-cordial so that a for each of one vertex $v\,|v_f(k) - v_f(-k)|$ is built to be at least 1 or equal.

There are at least two vertices, as is a graph $W_n \times P_2$, which reach its label as zero. The classification of H -cordial is impossible. Therefore, the graph $W_n \times P_2$ of even order is zero-M-cordial but not a H-cordial. □

Theorem 3.2. *Every $C_n \times P_2$ with n vertices concedes Zero - M Cordial Labeling.*

Proof. Let consent to G be a graph $C_n \times P_2$ Let authorize $V(G) = \{v_1, v_2, \dots v_n, v_1^{'}, v_2^{'}, \dots v_n^{'}\}$ and $E(G) = \{e_1, e_2, \dots e_n, e_1^{'}, e_2^{'}, \dots e_n^{'}\}$ with $V(G) = n$ and $E(G) = n + 2$ Now edges can be stated as,

$$E(G) = \{v_i v_{i+1}/1 \le i \le n/2 - 1\} \cup \left\{v_{n/2} v_{n/2-3}\right\} \cup \left\{v_{n/2} v_{n/2-3}\right\} \cup \left\{v_i v_{i+1}^{'}/1 \le i \le n/2 - 1\right\} \cup \{v_i v_i/i = 2n \quad \forall n \ge 0\}.$$

At this instant, delineate a function $f : E(G) \to \{1, -1\}$ by

$$f(v_i v_{i+1}) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases}, \text{ where } 1 \le i \le n/2 - 1$$

$$f\left(v_{n/2} v_{n/2-3}\right) = \begin{cases} 1, & \text{if } n \equiv 1(\text{mod}2) \\ -1, & \text{if } n \equiv 0(\text{mod}2) \end{cases}$$

$$f\left(v_i^{'} v_{i+1}^{'}\right) = \begin{cases} 1, & \text{if } \quad i \equiv 1(\text{mod}2) \\ -1, & \text{if } \quad i \equiv 0(\text{mod}2) \end{cases}, \text{ where } 1 \le i \le n/2 - 1$$

$$f\left(v_{n/2}^{'} v_{n/2-3}^{'}\right) = \begin{cases} 1, & \text{if } n \equiv 1(\text{mod}2) \\ -1, & \text{if } n \equiv 0(\text{mod}2) \end{cases}$$

$f(v_i v_i) = \pm 1$, where $i = 2n$.

The entire number of labelled edges is calculated by $1's$ and $-1's$ are specified by $e_f(-1) = \frac{n+2}{2}$ and $e_f(1) = \frac{n+2}{2}$. Accordingly for each vertex $v, f(v) = 0$ in addition to $|e_f(1) - e_f(-1)| \le 1$.

Therefore, $C_n \times P_2$ concedes Zero- M- Cordial Labeling. □

Illustration 3.2: Zero-M Cordial Labeling of the graph $C_8 \times P_2$ is exposed in Figure 2.

Remark 3.2. *Every $C_n \times P_2$ with n vertices concedes Zero - M Cordial Labeling but, not a H-cordial labeling.*

Theorem 3.3. *Every $B_n = W_n \times G_m \times P_2$ with n+m vertices concedes Zero-M Cordial Labeling.*

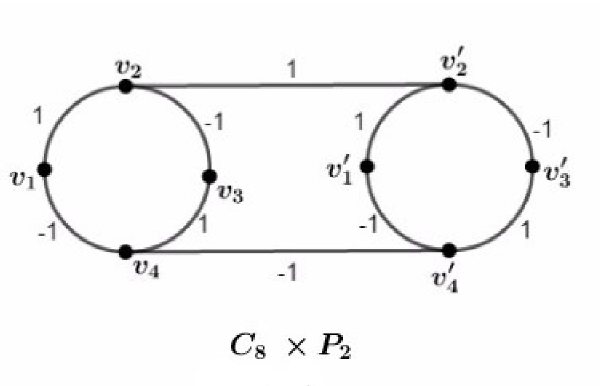


FIGURE 2

Proof. Let consent to G be a graph $B_n = W_n \times G_m \times P_2$. Let authorize $V(G) = \left\{v_1, v_2, \dots v_n, v_1, v_2, \dots v_n^{'}\right\}$ and $E(G) = \left\{e_1, e_2, \dots e_n, e_1^{'}, e_2^{'}, \dots e_n^{'}\right\}$ with $V(G) = n + m$ and $E(G) = 2(n + m - 3)$.

Now edges can be stated as,

$$\begin{aligned} E\left(B_n\right) &= \{v_1 v_i / 2 \leq i \leq n\} \cup \{v_i v_{i+1} / 2 \leq i \leq n-1\} \cup \{v_n v_{n-2}\} \\ &\cup \left\{v_1^{'} v_{2i}^{'} / 1 \leq i \leq n-1\right\} \cup \left\{v_i^{'} v_{i+1}^{'} / 2 \leq i \leq m-1\right\} \\ &\cup \{v_m v_{n-3}\} \cup \{v_{2n+1} v_{2n+2}\} \cup \{v_{2n+1} v_{2n+2} \forall n \geq 2\}. \end{aligned}$$

At this instant, delineate a function $f : E(G) \to \{1, -1\}$ by

$$f\left(v_1, v_i\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \text{ where } 2 \leq i \leq n$$

$$f\left(v_i v_{i+1}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \text{ where } 2 \leq i \leq n-1$$

$$f\left(v_n v_{n-3}\right) = \begin{cases} 1, & \text{if } n \equiv 1(\text{mod}2) \\ -1, & \text{if } n \equiv 0(\text{mod}2) \end{cases}$$

$$f\left(v_1^{'} v_{2i}^{'}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \text{ where } 1 \leq i \leq n-1$$

$$f\left(v_i^{'} v_{i+1}^{'}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \text{ where } 2 \leq i \leq m-1$$

$$f\left(v_m v_{m-7}\right) = \begin{cases} 1, & \text{if } m \equiv 1(\text{mod}2) \\ -1, & \text{if } m \equiv 0(\text{mod}2) \end{cases}.$$

$$f\left(v_{2n+1} v'_{2n+1}\right) = \begin{cases} 1, & \text{if } n \equiv 0(\text{mod}2) \\ -1, & \text{if } n \equiv 1(\text{mod}2) \end{cases} \quad \forall n \geq 1.$$

$$f\left(v_{2n+1} v'_{2n+2}\right) = \begin{cases} 1, & \text{if } n \equiv 1(\text{mod}2) \\ -1, & \text{if } n \equiv 0(\text{mod}2) \end{cases} \quad \forall n \geq 2s$$

The entire number of edges labelled with 1's and -1 's are specified by $e_f(-1) = n + m - 3$ and $e_f(1) = n + m - 3$. Accordingly for every vertex $v, f(v) = 0$ in addition to $|e_f(1) - e_f(-1)| \leq 1$.

Therefore, $W_n \times G_m \times P_2$ concedes Zero - M Cordial Labeling. □

Illustration 3.3: Zero $-$ M Figure 3 shows Cordial Labeling of the graph $W_5 \times G_9 \times P_2$.

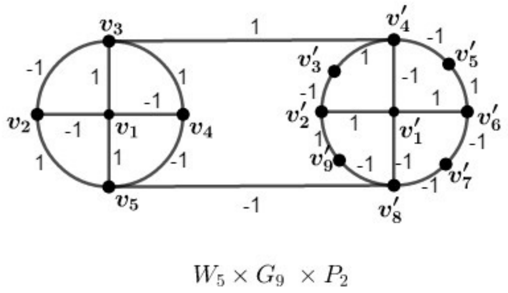


FIGURE 3

Remark 3.3. *Every $W_n \times G_m \times P_2$ with $(n+$ m)vertices concedes Zero $-M$ Cordial Labeling but, not a H-cordial labeling.*

Theorem 3.4. *Every $G = W_n \times C_m \times P_2$ with $n + m$ vertices concedes Zero - M Cordial Labeling.*

Proof. Let G be $G = W_n \times C_m \times P_2$ graph. Let authorize $V(G) = \{v_1, v_2, \ldots v_n, v'_1, v'_2, \ldots v'_n\}$ and $E(G) = \left\{e_1, e_2, \ldots e_n, e'_1, e'_2, \ldots e'_n\right\}$ with $V(G) = n+m$ and $E(G) =$

$2(n+m-2)$. Now edges can be stated as,

$$E(G)=\{v_1v_i/2\leq i\leq n\}\cup\{v_iv_{i+1}/2\leq i\leq n-1\}\cup\left\{v_i^{'}v_{i+1}^{'}/1\leq i\leq m-1\right\}$$
$$\cup\{v_mv_{m-3}\}\cup\{v_nv_{n-3}\}\cup\left\{v_iv_{i+1}^{'}/i=2n+1\quad\forall n\geq 1\right\}.$$

Now at this instant, delineate a function $E(G)\to\{1,-1\}$ by

$$f\left(v_1v_i\right)=\begin{cases}1, & \text{if } i\equiv 1(\mathrm{mod}2)\\ -1, & \text{if } i\equiv 0(\mathrm{mod}2)\end{cases}\quad\text{where } 2\leq i\leq n$$

$$f\left(v_iv_{i+1}\right)=\begin{cases}1, & \text{if } i\equiv 1(\bmod 2)\\ -1, & \text{if } i\equiv 0(\mathrm{mod}2)\end{cases}\quad\text{where } 2\leq i\leq n-1$$

$$f\left(v_i^{'}v_{i+1}^{'}\right)=\begin{cases}1, & \text{if } i\equiv 1(\mathrm{mod}2)\\ -1, & \text{if } i\equiv 0(\mathrm{mod}2)\end{cases}\quad\text{where } 1\leq i\leq m-1$$

$$f(v_mv_{m-3})=\begin{cases}1, & \text{if } i\equiv 1(mod2)\\ -1, & \text{if } i\equiv 0(mod2)\end{cases}.$$

$$f(v_nv_{n-3})=\begin{cases}1, & \text{if } i\equiv 1(mod2)\\ -1, & \text{if } i\equiv 2(mod2)\end{cases}.$$

$$f\left(v_iv_{i-1}^{'}\right)=\pm 1\quad\text{if } i=2n+1\quad\forall n\geq 1.$$

The entire number of labelled edges is calculated by $1^{'}$ s and -1 's are specified by $e_f(-1)=n+m-2$ and $e_f(1)=n+m-2$. Accordingly, for every vertex $v_1f(v)=0$ in addition to $|e_f(1)-e_f(-1)|\leq 1$.

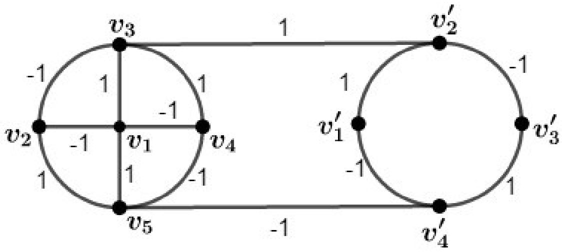
Therefore, $W_n\times C_m\times P_2$ concedes Zero - M Cordial Labeling. ☐

Illustration 3.4: Zero $-$ M Zero - M Figure 4 shows Cordial Labeling of the graph $W_5\times C_4\times P_2$.

Remark 3.4. *Every $G=W_n\times C_m\times P_2$ with $(n+m)$ vertices concedes Zero $-M$ Cordial Labeling but, not a H -cordial labeling.*

Theorem 3.5. *Every $G_n\times G_n\times P_2$ with n vertices concedes Zero-M Cordial Labeling.*

Proof. Let consent to G be a graph $G=G_n\times G_n\times P_2$. Let authorize $V(G)=\left\{v_1,v_2,\ldots v_n,v_1^{'},v_2^{'},\ldots v_n^{'}\right\}$ and $E(G)=\{e_1,e_2,\ldots e_n,e_1,e_2,\ldots e_n\}$ with $V(G)=$



$W_5 \times C_4 \times P_2$

FIGURE 4

$2n$ and $E(G) = 2(2n-5)$ Now edges can be stated as,

$$E(G) = \left\{v_1 v_{2i}/1 \leq i \leq \frac{n+2}{4}\right\} \cup \{v_i v_{i+1}/2 \leq i \leq n/2-1\}$$
$$\cup \left\{v_1^{'} v_{2i}^{'}/1 \leq i \leq \frac{n+2}{4}\right\} \cup \left\{v_i^{'} v_{i+1}^{'}/2 \leq i \leq n/2-1\right\}$$
$$\cup \left\{v_{n/2}\ v_{n/2-7}\right\} \cup \left\{v_{n/2}^{'} v_{n/2}^{'},\ \cup \{v_i v_i/i = 2n+2 \forall n > 2\}\right. .$$

At this instant, delineate a function $f : E(G) \to \{1, -1\}$ by

$$f(v_1 v_{2i}) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \quad \text{where } 1 \leq i \leq \tfrac{n+2}{4}$$

$$f(v_i v_{i+1}) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \quad \text{where } 2 \leq i \leq n/2-1$$

$$f\left(v_{n/2}\ v_{n/2-7}\right) = \begin{cases} 1, & \text{if } n \equiv 0(\text{mod}2) \\ -1, & \text{if } n \equiv 1(\text{mod}2) \end{cases}$$

$$f\left(v_1^{'} v_{2i}^{'}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \quad \text{where } 1 \leq i \leq \tfrac{n+2}{4}$$

$$f\left(v_i^{'} v_{i+1}^{'}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \quad \text{where } 2 \leq i \leq n/2-1$$

$$f\left(v'_{n/2'}v'_{n/2-7}\right) = \begin{cases} 1, & \text{if } n \equiv 0(\text{mod}2) \\ -1, & \text{if } n \equiv 1(\text{mod}2) \end{cases} \quad \text{where } i = 2n+2 \quad \forall n > 2$$

$$f\left(v_i v'_i\right) = \pm 1.$$

The entire number of labelled edges is calculated bye $f(-1) = n-5$ and $e_f(1) = n-5$ with 1 digit and -1 digit Accordingly, for each vertex $v, f(v) = 0$ in addition to $|e_f(1) - e_f(-1)| \leq 1$ Hence, $G_n \times G_n \times P_2$ concedes Zero - M Cordial Labeling. □

Illustration 3.5: Zero-M Figure 5 shows Cordial Labeling of the graph $G_n \times G_n \times P_2$.

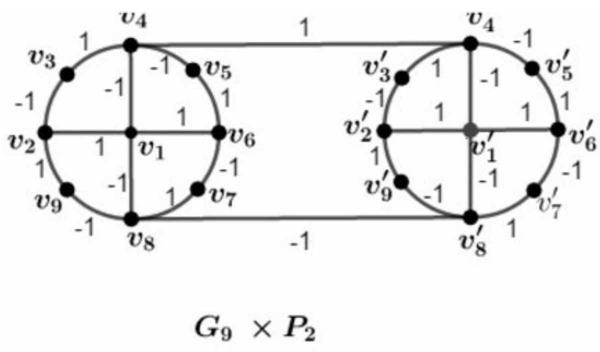


FIGURE 5

Remark 3.5. *Every $G_n \times G_n \times P_2$ with $(2n)$ vertices concedes Zero $-M$ Cordial Labeling but, not a H -cordial labeling.*

Proof. Taking part in the above example, among the 26 edges 13 edges obtain +1 and the other 13 edges obtain − 1. Label edges as $+1, -1, 1, -1_{\mu} \ldots$ As $G_n \times G_n \times P_2$ is a graph there exists atleast two vertices that attains its label as zero. This is not possible to the exactness of H-cordial. Hence the graph $G_n \times G_n \times P_2$ of even mandate is zero-M-cordial but not a H- cordial. □

Theorem 3.6. *Every $H_n \times P_2$ with n vertices concedes Zero-M Cordial Labeling.*

Proof. Let consent to G be a graph $H_n \times P_2$. Let authorize $V(G) = \{v_1, v_2, \ldots v_n, v'_1, v'_2, \ldots v'_n\}$ and $E(G) = \{e_1, e_2, \ldots e_n, e'_1, e'_2, \ldots e'_n\}$ with $V(G) = n$ and $E(G) =$

$(n+16)$. Now edges can be stated as,

$$E(G) = \left\{v_1v_{2i}/1 \leq i \leq \frac{n/2-1}{4}\right\} \cup \left\{v_1v_{2i+1}/1 \leq i \leq \frac{n/2-1}{4}\right\}$$
$$\cup \left\{v_iv_{i+1}/2 \leq i \leq \frac{n/2-1}{2}\right\} \cup \left\{\frac{v_{n/2+1}}{2}\frac{v_{n/2}+1}{2} - 7\right\}$$
$$\cup \left\{v_iv_{i+\frac{n}{2}-1}/2 \leq i \leq \frac{n/2+1}{2}\right\} \cup \left\{v_1^{'}v_{2i}^{'}/1 \leq i \leq \frac{n/2-1}{4}\right\}$$
$$\cup \left\{v_1^{'}v_{2i+1}^{'}/1 \leq i \leq \frac{n/2-1}{4}\right\} \cup \left\{v_iv_{i+1}^{'}/2 \leq i \leq \frac{n/2-1}{2}\right\} \cup \left\{ \ \frac{v_{n/2+1}^{'}}{2}\frac{v_{n/2}^{'}+1}{2} \ \right\}$$
$$\cup \left\{v_i^{'}v_{i+\frac{n/2+1}{2}}^{'}, //2 \leq i \leq \frac{n/2+1}{2}\right\} \cup \left\{v_iv_i^{'}/i = 2n+2\forall n \geq 5 \ and \ n \ is \ odd\right\}.$$

At this instant, delineate a function $E(G) \rightarrow \{1, -1\}$ by

$$f(v_1v_{2i}) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \text{ where } 1 \leq i \leq \tfrac{n-2}{8}$$

$$f(v_1v_{2i+1}) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \text{ where } 1 \leq i \leq \tfrac{n-2}{8}$$

$$f(v_iv_{i+1}) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \quad \text{where } 2 \leq i \leq \tfrac{n-2}{4} \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases}$$

$$f\begin{pmatrix} v_{n+2}v_{n+2} \\ \frac{4}{4} - 7 \end{pmatrix} = \begin{cases} 1, & \text{if } n \equiv 0(\text{mod}2) \\ -1, & \text{if } n \equiv 1(\text{mod}2) \end{cases}$$

$$f\left(v_iv_{i+\frac{n-2}{4}}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \quad \text{where } 2 \leq i \leq \tfrac{n+2}{4}$$

$$f\left(v_1^{'}v_{2i}^{'}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases}. \text{ where } 1 \leq i \leq \tfrac{n-2}{8}$$

$$f\left(v_1^{'}v_{2i+1}^{'}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases} \text{ where } 1 \leq i \leq \tfrac{n-2}{8}$$

$$f\left(v_1^{'}v_{i+1}^{'}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\text{mod}2) \quad \text{where } 2 \leq i \leq \tfrac{n-2}{4} \ | \\ -1, & \text{if } i \equiv 0(\text{mod}2) \end{cases}$$

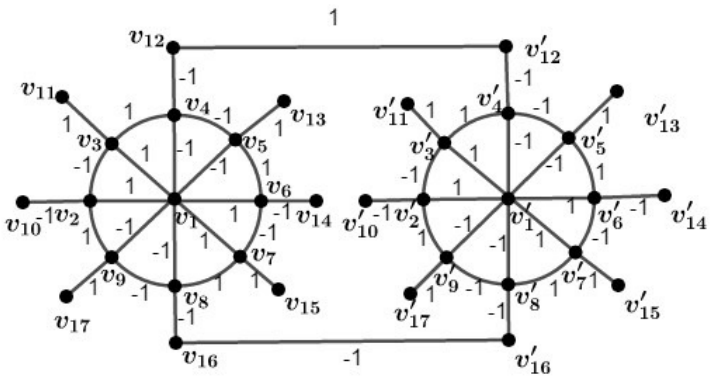
$$f\left(v'_{\frac{n+2}{4}} v'_{\frac{n+2}{4}-7} \right) = \begin{cases} 1, & \text{if } i \equiv 0(\mathrm{mod}2) \\ -1, & \text{if } i \equiv 1(\mathrm{mod}2) \end{cases}$$

$$f\left(v'_i v'_{i+\frac{n-2}{4}}\right) = \begin{cases} 1, & \text{if } i \equiv 1(\mathrm{mod}2) \quad \text{where } 2 \leq i \leq \frac{n+2}{4} \\ -1, & \text{if } i \equiv 0(\mathrm{mod}2) \end{cases}$$

The entire number of edges labelled with $1's$ and $-1's$ are specified by $e_f(1) = n/2+8$ and $e_f(-1) = n/2+8$. Accordingly, in addition to each vertex $v, f(v) = 0$ in addition to $|e_f(1) - e_f(-1)| \leq 1$.

So it is. $H_n \times P_2$ concedes Zero - M Cordial Labeling. □

Illustration 3.6: Zero − M Figure 6 shows cordial graph labeling.



$H_{34} \times P_2$

FIGURE 6

Remark 3.6. *Every $H_n \times P_2$ with n vertices concedes Zero - M Cordial Labeling but, not a H -cordial labeling.*

4. CONCLUSION

In this paper the exploration of Zero - M cordial Labeling but not a H-cordial Labelling for some special combination of graphs and behavior of few standard graphs.

5. SCOPE OF FURTHERSTUDY

Cordial Zero-M marking may be studied for a complete bipartite graph and tripartite graph.

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