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TREE RELATIVELY PRIME CORDIAL GRAPH

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Abstract

Let $G = (V, G)$ be a graph with p vertices and q edges. A Analytic Mean Cordial Labeling of a Graph G with vertex set is a bijection from $v = \{1,2 \ldots..p\}$.The induced edge labelling are defined by $f(u, v) = 0$ if either $f(u)$ divides $f(v)$ (or) $f(v)$ divides $f(u)$ one otherwise and if any one of the vertex label is 1, the induced edge label is 0.

The graph that admits a Relatively Prime Cordial Graph is called Relatively Prime Cordial Graph. In this paper, we proved that path related graphs $(K_{1.n}: n)$, $K_{1,n}$, $B_{n,n}$, Hd_n Relatively Prime Cordial Graph.

Introduction

A graph G is a finite non-empty set of objects called vertices together with a set of unordered pairs of distinct vertices of G which is called edges. Each pair $e = \{u, v\}$ of vertices in E is called an edge or a line of G in which e is said to join u and v. We write $e = uv$ and say that u and v are adjacent vertices (sometimes denoted as $u\ adj\ v$); vertex u and the edge e are incident with each other, as are v and e. If two distinct edges $e_1$and e_2 are incident with a common vertex, then they are called $adjacent\ edges$. A graph with p vertices and q edges is called $(p, q) -$ graph. In this paper, we proved that path related graphs $(K_{1.n}: n)$, $K_{1,n}$, $B_{n,n}$, Hd_n are Relatively Prime Cordial Graph. For graph theory terminology, we follow [2].

Preliminaries

Let $G = (V, G)$ be a graph with p vertices and q edges. A Analytic Mean Cordial Labeling of a Graph G with vertex set is a bijection from $v = \{1,2 \ldots..p\}$.The induced edge labelling are defined by $f(u, v) = 0$ if either $f(u)$ divides $f(v)$ (or) $f(v)$ divides $f(u)$ one otherwise and if any one of the vertex label is 1, the induced edge label is 0.

The graph that admits a Relatively Prime Cordial Graph is called Relatively Prime Cordial Graph. In this paper, we proved that path related graphs $(K_{1.n}: n)$, $K_{1,n}$, $B_{n,n}$, Hd_n are Relatively Prime Cordial Graph.

Definition: 2.1

Subdivided star is a graph obtained as oone point union of n paths of path length 2. It is denoted by $(K_{1.n}: n)$

Definition: 2.2

Star of length one is joined with every vertex of a path P_n through an edge. It is denoted by $K_{1,n}$.

Definition: 2.3

In Bistar the root of a star S_m and S_n is joined through a vertex w. It is denoted by $<B_{m,n:w}>$

Definition: 2.4

H is a graph obtained from a path $P_n$by attaching a pendent edge to every internal vertices of the path. It is called Hurdle graph with n-2 hurdles and is denoted by Hd_n

Main results

Theorem 3.1

Sub divided star $< K_{1.n}: n >$ is Relatively Prime Cordial Graph

Proof

Let G be $< K_{1.n}: n >$

Let $V(G) = \{u, u_i, v_i, w_i, z_i; 1 \leq i \leq \frac{n}{2}\}$

Let $E(G) = \{[(uu_i): 1 \leq i \leq \frac{n}{2}]\ U[(uv_i): 1 \leq i \leq \frac{n}{2}]U[(u_iw_i): 1 \leq i \leq \frac{n}{2}]U[(v_iz_i): 1 \leq i \leq \frac{n}{2}\}$

$$Define\ f\ :\ V(G)\ \rightarrow\ \{1,2, \ldots.p\}$$

Vertex Labeling:

$$f(u) = 2$$

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$$f(u_i) = 4i \qquad 1 \le i \le \frac{n}{2}$$
$$f(v_i) = 4i - 1 \qquad 1 \le i \le \frac{n}{2}$$
$$f(w_i) = 4i + 2 \qquad 1 \le i \le \frac{n}{2}$$
$$f(z_i) = 4i + 1 \qquad 1 \le i \le \frac{n}{2}$$

Edge Labeling:

$$f^*(uu_i) = 0 \qquad 1 \le i \le \frac{n}{2}$$
$$f^*(uv_i) = 1 \qquad 1 \le i \le \frac{n}{2}$$
$$f^*(u_iw_i) = 0 \quad 1 \le i \le \frac{n}{2}$$
$$f^*(v_iz_i) = 1 \quad 1 \le i \le \frac{n}{2}$$

Here, When n=m

$$e_f(0) = 2m$$
$$e_f(1) = 2m$$
$$| e_f(1) - e_f(0) | \le 1$$

Hence, Sub divided star $< K_{1.n}: n >$ is Relatively Prime Cordial Graph.
For example, The Relatively Prime Cordial Graph of Sub divided star $< K_{1.n}: n >$ are shown in the figure

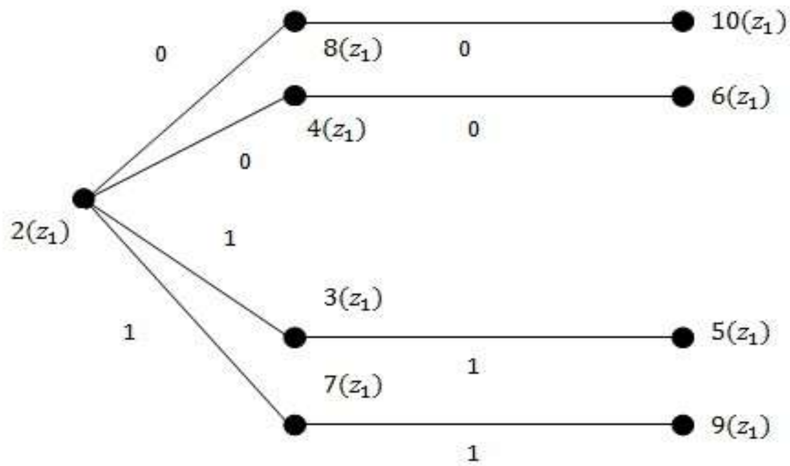

Figure3.1

Theorem:3.2
$K_{1,n}$ is a Relatively Prime Cordial Graph.
Proof:
Let G be $(K_{1,n})$
Let $V(G) = \{u, u_i: 1 \le i \le n\}$
Vertex Labeling:
Let $E(G) = \{[(uu_i): 1 \le i \le n]\}$

$$f(u) = 2$$
$$f(u_i) = i + 2 \qquad 1 \le i \le n$$

Edge Labeling:

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$$f^*(uui) = \begin{cases} 1 & i \equiv 1 mod 2 \\ 0 & i \equiv 0 mod 2 \end{cases} \quad 1 \le i \le n$$

Here, When n=2m

$$e_f(0) = m$$

$$e_f(1) = m$$

When $n = 2m + 1$

$$e_f(0) = m$$

$$e_f(1) = m + 1$$

| $e_f(1)$ - $e_f(0)$ | ≤ 1

Hence, $K_{1,n}$ is Relatively Prime Cordial Graph.

For example, The Relatively Prime Cordial Graph of Sub divided star ($K_{1,n}$) are shown in the figure

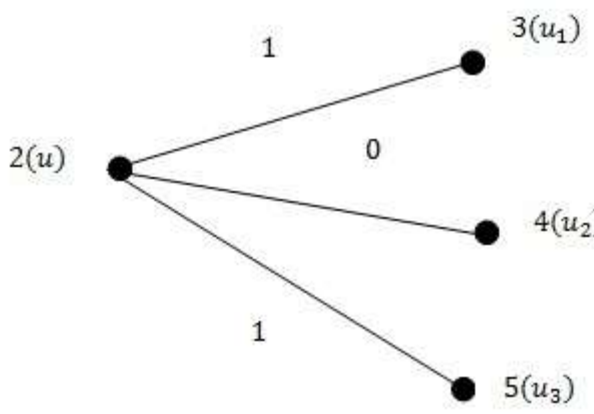

figure 3.2

Theorem:3.3
Bistar $B_{n,n}$ is Relatively Prime Cordial Graph.
Proof:

Let G be $B_{n,n}$

Let $V(G) = \{u, v, u_i, v_i; 1 \le i \le n\}$

Let $E(G) = \{[(uv)]U[(uu_i): 1 \le i \le n]U[(vv_i): 1 \le i \le n]\}$

$$Define\ f : V(G) \to \{1,2, \ldots . p\}$$

Vertex Labeling:

$$f(u) = 1$$

$$f(v) = 2$$

$$f(u_i) = 2i + 2 \qquad 1 \le i \le n$$

$$f(v_i) = 2i + 1 \qquad 1 \le i \le n$$

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Edge Labeling:

$$f^*(uv) = 0$$

$$f^*(uu_i) = 0 \quad 1 \leq i \leq n$$

$$f^*(vv_i) = 1 \quad 1 \leq i \leq n$$

Here, when $n = m$

$$e_f(0) = m + 1$$

$$e_f(1) = m$$

$| e_f(1)$ - $e_f(0) | \leq 1$

Hence, $B_{n,n}$is Relatively Prime Cordial Graph.

For example, The Relatively Prime Cordial Graph of Sub divided star $B_{n,n}$ are own in the figure

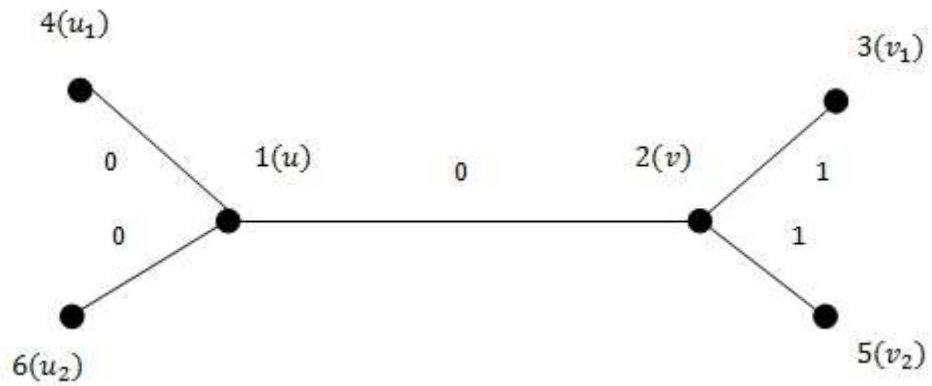

figure 3.3

Theorem3.4

Graph Hd_n is a Relatively Prime Cordial Graph.

Proof:

Let G be Hd_n

Let $V(G) = \{[u_i; 1 \leq i \leq n], [v_i; 1 \leq i \leq n-2]\}$

Let $E(G) = \{[(u_i u_{i+1})$:1$\leq i \leq n-1] U [(v_i u_{i+1})$: $1 \leq i \leq n-2]\}$

$$Define\ f\ :\ V(G)\ \rightarrow\ \{1,2, \ldots .p\}$$

Vertex Labeling:

$$f(u_i) = 2i \qquad 1 \leq \ i \leq n$$

$$f(v_i) = 2i + 1 \qquad 1 \leq \ i \leq n$$

Edge Labeling:

$$f^*(u_i u_{i+1}) = 0 \quad 1 \leq i \leq n-1$$

$$f^*(v_i u_{i+1}) = 1 \quad 1 \leq i \leq n-2$$

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Here ,When $n = m$

$$e_f(0) = m - 1$$

$$e_f(1) = m - 2$$

$| e_f(1) - e_f(0) | \leq 1$

Hence, Hd_n is Relatively Prime Cordial Graph.
For example, The Relatively Prime Cordial Graph of Hd_n are shown in the figure

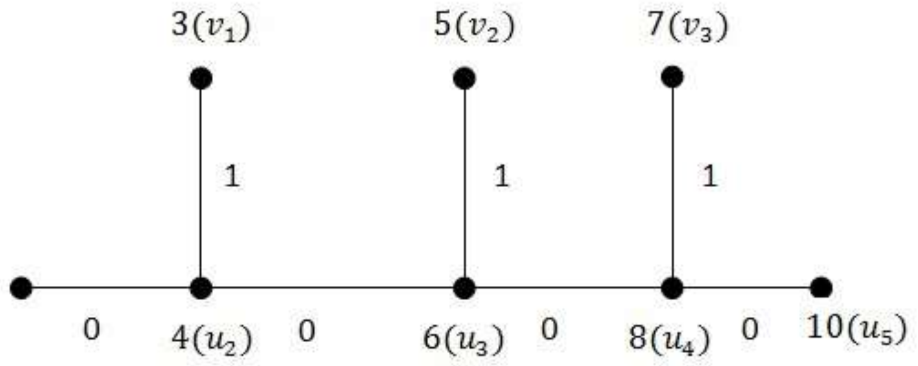

Figure3.4

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