



Relatively Prime Cordial Graph

A. Nellai Murugan and V.Nishanthini, Department of Mathematics,
V.O.Chidambaram College, Thoothukudi, Email: anellai.voc@gmail.com

Abstract – Let $G = (V, E)$ 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 $v = \{1, 2, \dots, p\}$. 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 Fish Graph and Butterfly Graph are Relatively Prime Cordial Graph.

Keywords: Relatively Prime Cordial Graph, Relatively Prime Cordial Labeling.
2000 Mathematics Subject Classification 05C78.

I. 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 $u \text{ adj } v$); 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 that Fish Graph and Butterfly Graph are Relatively Prime Cordial Graph. For graph theory terminology, we follow [2].

II. Preliminaries

Let $G = (V, E)$ 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 $v = \{1, 2, \dots, p\}$. 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.

Relatively Prime Cordial Graph

The graph that admits a Relatively Prime Cordial Graph is called Relatively Prime Cordial Graph. In this paper, we proved that Fish Graph and Butterfly Graph are Relatively Prime Cordial Graph.

Definition: 2.1

Fish Graph is a graph with six vertices and seven edges.

Definition: 2.2

Butterfly Graph is a graph with five vertices and six edges.

3. MAIN RESULTS

THEOREM: 3.1

Fish Graph is Relatively Prime Cordial Graph.

Proof:

Let G be a Fish graph

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

Let

$$E(G) = \{(u_i u); 1 \leq i \leq 2\} \cup \{(v_i u); i \leq i \leq 2\} \cup \{u_1 u_2\} \cup \{(v_1 v_2)\}$$

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

Vertex labelling:

$$f(u_1) = 5$$

$$f(u_2) = 3$$

$$f(v_1) = 1$$

$$f(v_2) = 6$$

$$f(u) = 2$$

$$f(v) = 4$$

Edge labelling:

$$f^*(u_i u) = 1; 1 \leq i \leq 2$$

$$f^*(u_i v) = 1; 1 \leq i \leq 2$$

$$f^*(u_2 v_1) = 0; 1 \leq i \leq 2$$

$$f^*(v_1 v_2) = 0$$

Hence, Fish Graph is Relatively Prime Cordial Graph.

The Relatively Prime Cordial Labelling of Fish Graph is shown in *figure 3.1*.

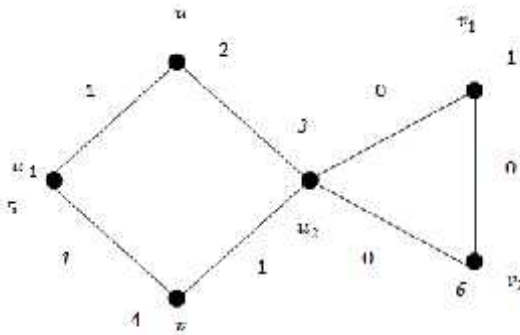


figure 3.1

THEOREM: 3.2

Butterfly Graph is a Relatively Prime Cordial Graph.

Proof:

Let G be a graph

$$\text{Let } V(G) = \{u_i v_i; 1 \leq i \leq 2, u\}$$

$$\text{Let } E(G) = \{[(u_i u); 1 \leq i \leq 2] \cup [(v_i u); 1 \leq i \leq 2] \cup [(u_1 u_2)] \cup [(v_1 v_2)]\}$$

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

$$\text{Let } V(G) = \{u_i v_i; 1 \leq i \leq 2, u\}$$

$$\text{Let } E(G) = \{[(u_i u); 1 \leq i \leq 2] \cup [(v_i u); 1 \leq i \leq 2] \cup [(u_1 u_2)] \cup [(v_1 v_2)]\}$$

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

The vertex labelling is,

$$\begin{aligned} f(u_i) &= i & 1 \leq i \leq 2 \\ f(v_i) &= 2i + 1 & 1 \leq i \leq 2 \\ f(u) &= 4 \end{aligned}$$

The Edge labelling is,

$$\begin{aligned} f^*(u_i u) &= 0; 1 \leq i \leq 2 \\ f^*(u v_i) &= 1; 1 \leq i \leq 2 \\ f^*(u_1 u_2) &= 0 \\ f^*(v_1 v_2) &= 1 \end{aligned}$$

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Hence, Butterfly Graph is Relatively Prime Cordial Graph.

The Relatively Prime Cordial Graph of Butterfly is shown in figure 3.2

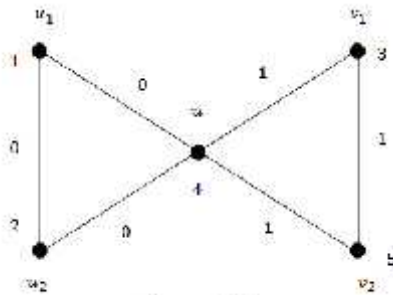


figure 3.2

4. References:

- G.J. Gallian, *A Dynamic survey of graph labeling*, The electronic journal of combinatorics, 16 (2009), #DS6.
- S.W Golomb, *How to number a graph in graph Theory and computing*, R.C. Read, ed., Academic Press, New York (1972), 23-37.
- A. Rosa, *On certain valuations of the vertices of a graph*, Theory of graphs (International Symposium, Rome), July (1966).
- Frank Harary, *Graph Theory*, Narosa publishing house pvt. Ltd., 10th reprint 2001.
- J Gross and J Yeien, *Handbook of graph theory*, CRC Press, 2004.
- M. Hovey, *A-cordial graphs*, Discrete Math., Vol 93(1991), 183-194.
- R.Tao, *On k-cordiality of cycles, crowns and wheels*, Systems Sci. 11(1998), 227-229.
- M.Z. Youssef, *On k-cordial labeling*, Australas.J. Combin., Vol 43(2009), 31-37.
- M.V.Modha, K.K.Kanani, *Some new families of 5-cordial graphs*, International Journal of Mathematics and Soft Computing, Vol.5, No.1(2015), 129-141.
- L.Pandiselvi, S.NavaneethaKrishnan and A.NellaiMurugan, *Path Related V_4 Cordial graphs* International Journal of Recent advances in Multidisciplinary Research, Vol. 03, Issue 02, pp.1285-1294, February, 2016,
- L.Pandiselvi, S.NavaneethaKrishnan and A.NellaiMurugan, *Bi-Star V_4 Cordial Graphs* International Journal Of Advanced Science and Research Vol. 1, Issue 2, Feb 2016. Pg no:14-21.