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4-Total prime cordial labeling of some cycle related graphs

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ABSTRACT

Let G be a (p, q) graph. Let $f : V(G) \to \{1, 2, \ldots, k\}$ be a map where $k \in \mathbb{N}$ and $k > 1$. For each edge uv, assign the label $\gcd(f(u), f(v))$. f is called k-Total prime cordial labeling of G if $|t_f(i) - t_f(j)| \leq 1$, $i, j \in \{1, 2, \cdots, k\}$ where $t_f(x)$ denotes the total number of vertices and the edges labelled with x. A graph with a k-total prime cordial labeling is called k-total prime cordial graph. In this paper we investigate the 4-total prime cordial labeling of some graphs like Prism, Helm, Dumbbell graph, Sun flower graph.

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1 Introduction

Graphs considered here are finite, simple and undirected. Ponraj et al. [4], have been introduced the concept of k-total prime cordial labeling and the k-total prime cordial labeling of certain graphs have been investigated. Also in [4, 5, 6, 7, 8], the 4-total prime

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cordial labeling behaviour of path, cycle, star, bistar, some complete graphs, comb, double comb, triangular snake, double triangular snake, ladder, friendship graph, flower graph, gear graph, Jelly fish, book, irregular triangular snake, corona of irregular triangular snake, corona of some graphs and subdivision of some graphs and also the 3-total prime cordial labeling behaviour of path, cycle, star, comb, wheel, fan have been investigated [7]. In this paper we investigate the 4-total prime cordial labeling of few graphs like Prism, Helm, Dumbbell graph, Sun flower graph.

2 k-total prime cordial labeling

Definition 2.1 Let G be a (p, q) graph. Let $f : V(G) \to \{1, 2, \ldots, k\}$ be a function where $k \in \mathbb{N}$ and $k > 1$. For each edge uv, assign the label $\gcd(f(u),\ f(v))$. f is called k-Total prime cordial labeling of G if $|t_f(i) - t_f(j)| \leq 1,\ i, j \in \{1, 2, \cdots, k\}$ where $t_f(x)$ denotes the total number of vertices and the edges labelled with x. A graph with a k-total prime cordial labeling is called k-total prime cordial graph.

3 Preliminaries

Definition 3.1 An *n-sided prism* Pr_n is a planar graph having 2 faces viz., an inner face and outer face with n sides and every other face is a 4-cycle. In other words, it is $C_n \times K_2$.
Definition 3.2 The graph obtained by joining two disjoint cycles $u_1u_2 \ldots u_nu_1$ and $v_1v_2 \ldots v_nv_1$ with an edge u_1v_1 is called *dumbbell graph* Db_n.
Definition 3.3 The graph $W_n = C_n + K_1$ is called a *wheel.* In a Wheel, a vertex of degree 3 on the cycle is called a *rim vertex.* A vertex which is adjacent to all the rim vertices is called the *central vertex.* The edges with one end incident with a rim vertex and the other incident with the central vertex are called *spokes.*
Definition 3.4 The *Helm* H_n is obtained from a wheel W_n by attaching a pendent edge at each vertex of the cycle C_n.
Definition 3.5 The *Sunflower graph* SF_n is obtained from a Wheel with the central vertex v_0, the cycle $C_n : v_1v_2 \ldots v_nv_1$ and additional vertices $w_1w_2 \ldots w_n$ where w_i is joined by edges to v_i, v_{i+1} where v_{i+1} is taken modulo n.
remark. 2- total prime cordial graph is 2-total product cordial graph.

4 Main Results

Theorem 4.1 The graph prisms $C_n \times P_2$, is 4-total prime cordial for all $n \geq 3$.

Proof. Let $V(C_n \times P_2) = \{u_i, v_i : 1 \leq i \leq n\}$ and $E(C_n \times P_2) = \{u, u_n, v, v_n\} \cup \{u_iv_i : 1 \leq i \leq n\} \cup \{u_iu_{i+1}, v_iv_{i+1} : 1 \leq i \leq n-1\}$. It is easy to verift that $|V(C_n \times P_2)| + |E(C_n \times P_2)| = 5n$.
Case 1. $n \equiv 0 \pmod 4$.

Let $n = 4r$, $r > 1$ and $r \in \mathbb{N}$. Assign the label 4 to the vertices $u_1, u_2, \ldots, u_r$ and assign the label 2 to the vertices $u_{r+1}, u_{r+2}, \ldots, u_{2r}$. Next we assign the label 3 to the vertices $u_{2r+1}, u_{2r+2}, \ldots, u_{3r+1}$ then we assign 1 to the vertices $u_{3r+2}, u_{3r+3}, \ldots, u_{4r-1}$. Finally we assign the label 4 to the vertex u_{4r}. Next we consider the vertices v_i $(1 \leq i \leq n)$. Assign the label 4 to the vertices $v_1, v_2, \ldots, v_r$ and assign the label 2 to the vertices $v_{r+1}, v_{r+2}, \ldots, v_{2r}$ and next we assign the label 3 to the vertices $v_{2r+1}, v_{2r+2}, \ldots, v_{3r}$. Finally we assign the label 1 to the vertices $v_{3r+1}, v_{3r+2}, \ldots, v_{4r}$. Clearly $t_f(1) = t_f(2) = t_f(3) = t_f(4) = 5r$.

Case 2. $n \equiv 1 \pmod 4$.

Let $n = 4r + 1$, $r > 1$ and $r \in \mathbb{N}$. As in case 1, assign the label to the vertices u_i $(1 \leq i \leq n - 3)$ and v_i $(1 \leq i \leq n - 3)$. Finally we assign the labels 1, 2, 4, 4, 3, 1 respectively to the vertices u_{4r-2}, u_{4r-1}, u_{4r}, v_{4r-2}, v_{4r-1} and v_{4r}. Here $t_f(1) = t_f(3) = t_f(4) = 5r + 1$ and $t_f(2) = 5r + 2$.

Case 3. $n \equiv 2 \pmod 4$.

Let $n = 4r + 2$, $r > 1$ and $r \in \mathbb{N}$. Assign the label the vertices to u_i $(1 \leq i \leq n - 1)$ and v_i $(1 \leq i \leq n - 1)$ by case 2. Finally we assign the labels 4, 3 to the vertices u_{4r} and v_{4r} respectively. It is easy to verify that $t_f(1) = t_f(4) = 5r + 3$ and $t_f(2) = t_f(3) = 5r + 2$.

Case 4. $n \equiv 4 \pmod 4$.

Let $n = 4r + 3$, $r > 1$ and $r \in \mathbb{N}$. As in case 1, assign the label the vertices to u_i $(1 \leq i \leq n - 3)$ and v_i $(1 \leq i \leq n - 3)$. Finally we assign the labels 3, 3, 4, 2, 2, 4 respectively to the vertices u_{4r-2}, u_{4r-1}, u_{4r}, v_{4r-2}, v_{4r-1} and v_{4r}. Here $t_f(1) = t_f(2) = t_f(4) = 5r + 4$ and $t_f(3) = 5r + 3$.

Case 5. $n = 3, 4, 5, 6, 7$.

A 4-total prime cordial labeling follows from Table 1.

n	3	4	5	6	7
u_1	4	4	4	4	4
u_2	4	4	4	4	4
u_3	2	2	4	2	2
u_4		3	3	2	2
u_5			3	3	3
u_6				3	1
u_7					2
v_1	3	3	2	4	4
v_2	3	4	2	4	4
v_3	4	2	3	2	2
v_4		3	3	3	3
v_5			4	3	3
v_6				1	3
v_7					3

Table 1:

□

Theorem 4.2 The dumbbell graph Db_n is 4-total prime cordial for all $n \geq 3$.

Proof. Let $u_1u_2 \dots u_nu_1$ and $v_1v_2 \dots v_nv_1$ be the two disjoint cycles joining with an edge u_1v_1. Clearly $|V(Db_n)| + |E(Db_n)| = 4n + 1$.
Case 1. $n \equiv 0 \pmod 4$.
Let $n = 4r$, $r > 1$ and $r \in \mathbb{N}$. Assign the label 4 to the vertices $u_1, u_2, \dots, u_r$ and assign 2 to the vertices $u_{r+1}, u_{r+2}, \dots, u_{2r}$. Then we assign the label 3 to the vertices $u_{2r+1}, u_{2r+2}, \dots, u_{3r}$. Next we assign the labels 4, 3 respectively to the vertices u_{3r+1} and u_{3r+2}. Finally we assign the label 1 to the vertices $u_{3r+3}, u_{3r+4}, \dots, u_{4r}$. Now we move to the vertices v_i $(1 \leq i \leq n)$. Assign the label 4 to the vertices $v_1, v_2, \dots, v_r$ and assign 2 to the vertices $v_{r+1}, v_{r+2}, \dots, v_{2r}$. Then we assign the label 3 to the vertices $v_{2r+1}, v_{2r+2}, \dots, v_{3r}$. Next we assign the labels 4, 3 respectively to the vertices v_{3r+1} and v_{3r+2}. Finally we assign the label 1 to the vertices $v_{3r+3}, v_{3r+4}, \dots, v_{4r}$. Here $t_f(1) = t_f(2) = t_f(3) = 4r$ and $t_f(4) = 4r + 1$.
Case 2. $n \equiv 1 \pmod 4$.
Let $n = 4r + 1$, $r > 1$ and $r \in \mathbb{N}$. As in case 1, assign the label to the vertices u_i $(1 \leq i \leq n - 1)$ and v_i $(1 \leq i \leq n - 1)$. Finally we assign the labels 2, 3 to the vertices u_{4r} and v_{4r} respectively. Clearly $t_f(1) = t_f(3) = t_f(4) = 4r + 1$ and $t_f(2) = 4r + 2$.
Case 3. $n \equiv 2 \pmod 4$.
Let $n = 4r + 2$, $r > 1$ and $r \in \mathbb{N}$. As in case 2, assign the label to the vertices u_i $(1 \leq i \leq n-1)$ and v_i $(1 \leq i \leq n-3)$. Finally we assign the labels 4, 3, 1, 1 respectively to the vertices u_{4r}, v_{4r-2}, v_{4r-1} and v_{4r}. It is easy to verify that $t_f(1) = t_f(2) = t_f(3) = 4r+2$ and $t_f(4) = 4r + 3$.
Case 4. $n \equiv 3 \pmod 4$.
Let $n = 4r + 3$, $r > 1$ and $r \in \mathbb{N}$. Assign the label to the vertices u_i $(1 \leq i \leq n - 2)$ and v_i $(1 \leq i \leq n - 1)$ as in case 3. Finally we assign the labels 2, 4, 3 respectively to the vertices u_{4r-1}, u_{4r} and v_{4r}. Here $t_f(1) = t_f(3) = t_f(4) = 4r + 3$ and $t_f(2) = 4r + 4$.
Case 5. $n = 3, 4, 5, 6, 7$.
A 4-total prime cordial labeling follows from Table 2 and 3.

n	3	4	5	6	7
u_1	4	4	4	4	4
u_2	4	2	4	4	4
u_3	2	4	3	2	2
u_4		3	2	3	2
u_5			3	3	3
u_6				3	1
u_7					3
v_1	3	4	4	4	4
v_2	3	2	2	4	4
v_3	2	3	2	2	2

Table 2:

v_4		3	3	2	2
v_5			3	3	3
v_6				1	3
v_7					3

Table 3:

□

Theorem 4.3 The graph helm H_n is 4-total prime cordial for all the values of $n \geq 3$.

Proof. Let C_n be the cycle $u_1u_2\dots u_nu_1$. Let v_i $(1 \leq i \leq n)$ be the vertices adjacent to each vertex of the cycle C_n. Clearly $|V(H_n)| + |E(H_n)| = 5n + 1$.
Case 1. $n \equiv 0 \pmod 4$.
Let $n = 4r$, $r > 1$ and $r \in \mathbb{N}$.
Subcase 1. r is even.
Assign the label 4 to the central vertex u. Next assign the label 4 to the vertices $u_1, u_2, \dots, u_r$ and assign 2 to the vertices $u_{r+1}, u_{r+2}, \dots, u_{2r}$ then we assign the label 3 to the vertices $u_{2r+1}, u_{2r+2}, \dots, u_{\frac{7r}{2}}$. Finally we assign the label 1 to the vertices $u_{\frac{7r}{2}+1}, \dots, u_{4r}$. Now we consider the vertices v_i $(1 \leq i \leq n)$. Assign the label 4 to the vertices $v_1, v_2, \dots, v_r$ and assign 2 to the vertices $v_{r+1}, v_{r+2}, \dots, v_{2r}$ then we assign the label 3 to the vertices $v_{2r+1}, v_{2r+2}, \dots, v_{\frac{6r}{2}+1}$. Finally we assign the label 1 to the vertices $v_{\frac{6r}{2}+2}, \dots, v_{4r}$. Here $t_f(1) = t_f(2) = t_f(4) = 5r$ and $t_f(3) = 5r + 1$.
Subcase 2. r is odd.
Assign the label 4 to the central vertex u. Next assign the label 4 to the vertices $u_1, u_2, \dots, u_r$ and assign 2 to the vertices $u_{r+1}, u_{r+2}, \dots, u_{2r}$ then we assign the label 3 to the vertices $u_{2r+1}, u_{2r+2}, \dots, u_{\frac{7r-1}{2}}$. Finally we assign the label 1 to the vertices $u_{\frac{7r-1}{2}+1}, \dots, u_{4r}$. Now we consider the vertices v_i $(1 \leq i \leq n)$. Assign the label 4 to the vertices $v_1, v_2, \dots, v_r$ and assign 2 to the vertices $v_{r+1}, v_{r+2}, \dots, v_{2r}$ then we assign the label 3 to the vertices $v_{2r+1}, v_{2r+2}, \dots, v_{\frac{6r}{2}+1}$. Finally we assign the label 1 to the vertices $v_{\frac{6r}{2}+2}, \dots, v_{4r}$. Clearly $t_f(1) = 5r + 1$ and $t_f(2) = t_f(3) = t_f(4) = 5r$.
Case 2. $n \equiv 1 \pmod 4$.
Let $n = 4r + 1$, $r > 1$ and $r \in \mathbb{N}$.
Subcase 1. r is even.
As in subcase(1) of case 1, assign the label to the vertices u, u_i $(1 \leq i \leq n-2)$ and v_i $(1 \leq i \leq n-2)$. Finally we assign the labels 4, 1, 2, 1 to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r} respectively. Clearly $t_f(1) = t_f(3) = 5r + 1$ and $t_f(2) = t_f(4) = 5r + 2$.
Subcase 2. r is odd.
As in subcase(2) of case 1, assign the label to the vertices u, u_i $(1 \leq i \leq n-2)$ and v_i $(1 \leq i \leq n-2)$. Finally we assign the labels 4, 1, 2, 3 to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r} respectively. Obviously $t_f(1) = t_f(3) = 5r + 1$ and $t_f(2) = t_f(4) = 5r + 2$.
Case 3. $n \equiv 2 \pmod 4$.
Let $n = 4r + 2$, $r > 1$ and $r \in \mathbb{N}$.

Subcase 1. r is even.
As in subcase(1) of case 2, assign the label to the vertices u, u_i $(1 \leq i \leq n-2)$ and v_i $(1 \leq i \leq n-2)$. Finally we assign the labels 1, 3, 3, 2 respectively to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r}. Clearly $t_f(1) = t_f(2) = t_f(3) = 5r+3$ and $t_f(4) = 5r+2$.
Subcase 2. r is odd.
As in subcase(2) of case 2, assign the label to the vertices u, u_i $(1 \leq i \leq n-2)$ and v_i $(1 \leq i \leq n-2)$. Finally we assign the labels 3, 1, 3, 2 to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r} respectively. It is easy to verify that $t_f(1) = t_f(2) = t_f(3) = 5r+3$ and $t_f(4) = 5r+2$.
Case 4. $n \equiv 3 \pmod 4$.
Let $n = 4r+3$, $r > 1$ and $r \in \mathbb{N}$.
Subcase 1. r is even.
As in subcase(1) of case 2, assign the label to the vertices u, u_i $(1 \leq i \leq n-2)$ and v_i $(1 \leq i \leq n-2)$. Finally we assign the labels 4, 3, 2, 3 respectively to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r}. Here $t_f(1) = t_f(2) = t_f(3) = t_f(4) = 5r+4$.
Subcase 2. r is odd.
As in subcase(2) of case 2, assign the label to the vertices u, u_i $(1 \leq i \leq n-2)$ and v_i $(1 \leq i \leq n-2)$. Finally we assign the labels 4, 3, 2, 3 to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r} respectively. It is easy to verify that $t_f(1) = t_f(2) = t_f(3) = t_f(4) = 5r+4$.
Case 5. $n = 3, 4, 5, 6, 7$.
A 4-total prime cordial labeling follows from Table 4 and 5.

n	3	4	5	6	7
u_1	4	4	4	4	4
u_2	3	2	2	4	4
u_3	2	3	3	2	2

Table 4:

u_4		3	3	3	2
u_5			3	3	3
u_6				1	3
u_7					3
v_1	3	4	4	4	4
v_2	3	2	2	2	1
v_3	4	3	3	2	2
v_4		1	2	3	4
v_5			4	3	1
v_6				3	3
v_7					3

Table 5:

□

Theorem 4.4 The sunflower graph SF_n is 4-total prime cordial for all $n \geq 3$.

Proof. Let u be the central vertex of the cycle $C_n : u_1u_2 \dots u_nu_1$ and additional vertices $v_1v_2 \dots v_n$ where v_i is joined by edges to u_i, u_{i+1}. Clearly $|V(SF_n)| + |E(SF_n)| = 5n + 1$.
Case 1. $n \equiv 0 \pmod 4$.
Let $n = 4r$, $r > 1$ and $r \in \mathbb{N}$.
Subcase 1. r is even.
Assign the label 4 to the central vertex u. Next assign the label 4 to the vertices $u_1, u_2, \dots, u_r$ and assign 2 to the vertices $u_{r+1}, u_{r+2}, \dots, u_{2r}$ then we assign the label 3 to the vertices $u_{2r+1}, u_{2r+2}, \dots, u_{\frac{7r}{2}}$. Finally we assign the label 1 to the vertices $u_{\frac{7r}{2}+1}, \dots, u_{4r}$. Now we consider the vertices v_i $(1 \leq i \leq n)$. Assign the label 4 to the vertices $v_1, v_2, \dots, v_r$ and assign 2 to the vertices $v_{r+1}, v_{r+2}, \dots, v_{2r}$ then we assign the label 3 to the vertices $v_{2r+1}, v_{2r+2}, \dots, v_{3r}$. Next we assign the labels 4, 3 to the vertices $u_{\frac{7r}{2}}$ and $u_{\frac{7r}{2}+1}$ respectively. Finally we assign the label 1 to the vertices $v_{\frac{7r}{2}+2}, \dots, v_{4r}$. Here $t_f(1) = 6r + 1$ and $t_f(2) = t_f(3) = t_f(4) = 6r$.
Subcase 2. r is odd.
Assign the label 4 to the central vertex u. Next assign the label 4 to the vertices $u_1, u_2, \dots, u_r$ and assign 2 to the vertices $u_{r+1}, u_{r+2}, \dots, u_{2r}$ then we assign the label 3 to the vertices $u_{2r+1}, u_{2r+2}, \dots, u_{\frac{7r+1}{2}}$. Finally we assign the label 1 to the vertices $u_{\frac{7r+1}{2}+1}, \dots, u_{4r}$. Now we consider the vertices v_i $(1 \leq i \leq n)$. Assign the label 4 to the vertices $v_1, v_2, \dots, v_r$ and assign 2 to the vertices $v_{r+1}, v_{r+2}, \dots, v_{2r}$ then we assign the label 3 to the vertices $v_{2r+1}, v_{2r+2}, \dots, v_{3r}$. Next we assign the label 4 to the vertex v_{3r+1}. Finally we assign the label 1 to the vertices $v_{3r+2}, v_{3r+3}, \dots, v_{4r}$. Clearly $t_f(1) = 6r + 1$ and $t_f(2) = t_f(3) = t_f(4) = 6r$.
Case 2. $n \equiv 1 \pmod 4$.
Let $n = 4r + 1$, $r > 1$ and $r \in \mathbb{N}$.
Subcase 1. r is even.
As in subcase(1) of case 1, assign the label to the vertices u, u_i $(1 \leq i \leq n - 2)$ and v_i $(1 \leq i \leq n - 1)$. Finally we assign the labels 4, 3, 2 to the vertices u_{4r-1}, u_{4r} and v_{4r} respectively. Clearly $t_f(1) = t_f(2) = t_f(4) = 6r + 2$ and $t_f(3) = 6r + 1$.
Subcase 2. r is odd.
As in subcase(2) of case 1, assign the label to the vertices u, u_i $(1 \leq i \leq n - 2)$ and v_i $(1 \leq i \leq n - 2)$. Finally we assign the labels 4, 1, 2, 3 to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r} respectively. Obviously $t_f(1) = t_f(2) = t_f(4) = 6r + 2$ and $t_f(3) = 6r + 1$.
Case 3. $n \equiv 2 \pmod 4$.
Let $n = 4r + 2$, $r > 1$ and $r \in \mathbb{N}$.
Subcase 1. r is even.
As in subcase(1) of case 1, assign the label to the vertices u, u_i $(1 \leq i \leq n - 2)$ and v_i $(1 \leq i \leq n - 2)$. Finally we assign the labels 3, 4, 3, 2 respectively to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and v_{4r}. Clearly $t_f(1) = 6r + 4$ and $t_f(2) = t_f(3) = t_f(4) = 6r + 3$.
Subcase 2. r is odd.
As in subcase(2) of case 1, assign the label to the vertices u, u_i $(1 \leq i \leq n - 2)$ and v_i $(1 \leq i \leq n - 2)$. Finally we assign the labels 3, 4, 3, 2 to the vertices u_{4r-1}, u_{4r}, v_{4r-1} and

v_{4r} respectively. It is easy to verify that $t_f(1) = 6r+4$ and $t_f(2) = t_f(3) = t_f(4) = 6r+3$.
Case 4. $n \equiv 3 \pmod 4$.
Let $n = 4r + 3$, $r > 1$ and $r \in \mathbb{N}$.
Subcase 1. r is even.
As in subcase(1) of case 1, assign the label to the vertices u, u_i $(1 \leq i \leq n-3)$ and v_i $(1 \leq i \leq n-4)$. Finally we assign the labels 2, 3, 4, 3, 3, 4, 2 respectively to the vertices u_{4r-2}, u_{4r-1}, u_{4r}, v_{4r-3}, v_{4r-2}, v_{4r-1} and v_{4r}. Here $t_f(1) = t_f(2) = t_f(4) = 6r + 5$ and $t_f(3) = 6r + 4$.
Subcase 2. r is odd.
As in subcase(2) of case 2, assign the label to the vertices u, u_i $(1 \leq i \leq n-3)$ and v_i $(1 \leq i \leq n-4)$. Finally we assign the labels 4, 3, 3, 3, 2, 4, 2 to the vertices u_{4r-2}, u_{4r-1}, u_{4r}, v_{4r-3}, v_{4r-2}, v_{4r-1} and v_{4r} respectively. It is easy to verify that $t_f(1) = t_f(2) = t_f(4) = 6r + 5$ and $t_f(3) = 6r + 4$.
Case 5. $n = 3, 4, 5, 6, 7$.
A 4-total prime cordial labeling follows from Table 6.

n	3	4	5	6	7
u	4	2	4	4	4
u_1	4	4	4	4	4
u_2	2	4	2	4	4
u_3	3	3	4	2	2
u_4		3	3	3	3
u_5			3	3	3
u_6				3	3
u_7					2
v_1	4	4	4	4	4
v_2	3	2	2	2	2
v_3	3	3	3	2	1
v_4		2	3	3	3
v_5			1	2	3
v_6				3	1
v_7					4

Table 6:

□

References

[1] Cahit, I., Cordial graphs:A weaker version of graceful and harmonious graphs, *Ars Combinatoria*, **23**(1987), 201-207.

[2] Gallian, J.A., A Dynamic survey of graph labeling, *The Electronic Journal of Combinatorics*, **19** (2017) #Ds6.

[3] Harary, F., Graph theory, *Addision wesley*, New Delhi (1969).

[4] Ponraj, R., Maruthamani J., and Kala, R., k-Total prime cordial labeling of graphs, *Journal of Algorithms and Computation*, **50(1)**, 143-149.

[5] Ponraj, R., Maruthamani J., and Kala, R., Some classes of 4-Total prime cordial labeling of graphs, *Global Journal of Engineering science and Researches*, **5(11)**, 319-327.

[6] Ponraj, R., Maruthamani J., and Kala, R., Some 4-total prime cordial labeling of graphs, *Journal of Applied Mathematics and Informatics*, **37(1-2)** (2019), 149-156.

[7] Ponraj, R., Maruthamani J., and Kala, R., 4-total prime cordial labeling of some special graphs, *Jordan Journal of Mathematics and Statistics*, (Accepted for Publication).

[8] Ponraj, R., Maruthamani J., and Kala, R., Some results on 3-Total prime cordial labeling of graphs.(communicated)