

ON PRIME LABELING OF RING SUM GRAPHS AND CROWN GRAPH.

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ABSTRACT:

Prime labeling is defined as, in an edge adjacent vertices are relatively prime to each other. In this paper, we established the prime labeling of ring sum graphs and crown graphs by uniquely.

KEYWORDS: Prime graph, Ring sum graph, crown graph.

INTRODUCTION:

The notion of a prime labeling originated with Entringer and was introduced in a paper by Tout, Dabboucy and Howalla [1]. A graph with vertex set V is said to have a prime labeling if its vertices are labeled with distinct integers $1, 2, \dots, |V|$ such that for each edge $x y$ the labels assigned to x and y are relatively prime.[2]

Let $G = G(V, E)$ be a finite simple and undirected graph with V vertices and E edges. A bijection $f : V \rightarrow \{1, 2, \dots, |V|\}$ is called a prime labeling if for each edge $e = \{u, v\} \in E$, and $\text{GCD}(f(u), f(v)) = 1$. A graph that admits a prime labeling is called a prime graph [3,4]

Example :

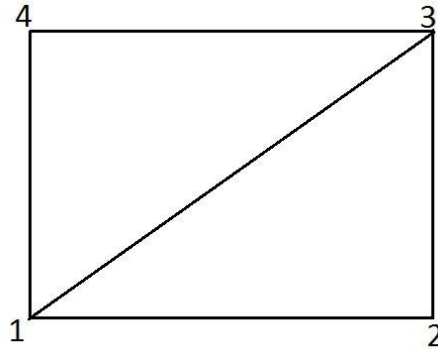


Fig Prime graph

Theorem 1:

Let G be a graph with vertex set $V(G) = \{ u, v, w, z, u_i ; 1 \leq i \leq n \}$ which admits a prime labeling.

The prime labeling of the graph is defined by

- i) $f(u) = 1,$
- ii) $f(v) = 2,$
- iii) $f(w) = 3,$
- iv) $f(z) = 4,$
- v) $f(u_i) = i+4 ; 1 \leq i \leq n$

Example:

when $n=7$

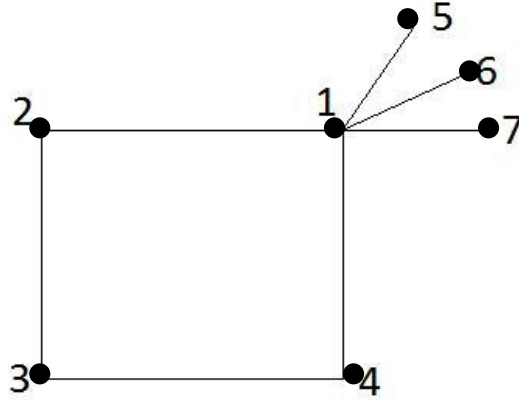


Fig prime labeling

Example:

when $n=9$

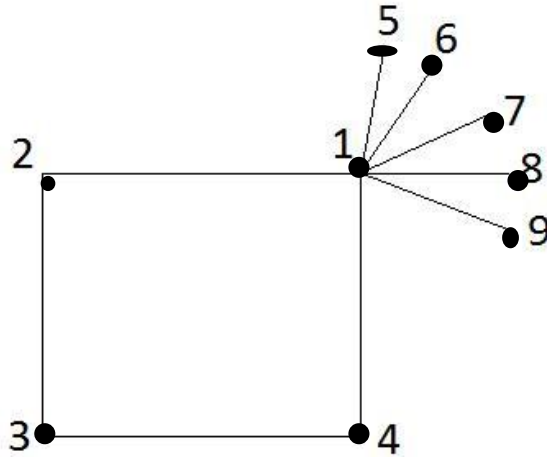


Fig: prime labeling

Theorem 4:

Let G be the fish tail graph is defined as follows

G be the graph with $V(G) = \{ u, u_i, w, v, 1 \leq i \leq n \}$

Which admits a prime labeling. The prime labeling of the graph is defined by

- i) $f(u) = 1$
- ii) $f(v) = 2$
- iii) $f(w) = 3$
- iv) $f(u_i) = 3+i, 1 \leq i \leq n$

Example:

when $n=6$

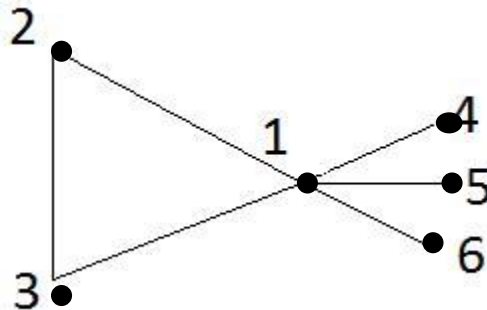


Fig : A Fish tail graph

Example: when $n=9$

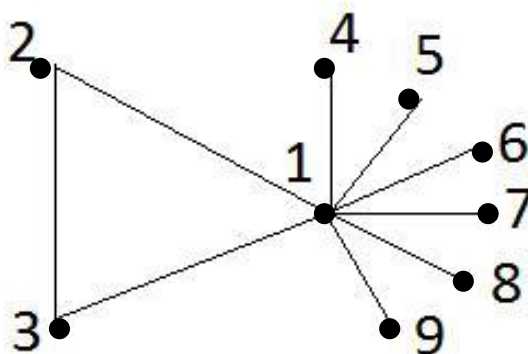


Fig : A Fish tail graph

Theorem :

C_n^+ is a graph obtained from G by attaching a pendent vertex from each vertex of the graph C_n is called Crown.

A Crown graph C_n^+ which admits a prime labeling.

In a crown graph vertices has to be partitioned in to Two categories

- i) Cycle vertices
- ii) Pendent vertices

Cycle vertices has to be labeled as always odd numbers $1, 3, \dots, n$.

Pendent vertices has to be labeled as always an even number $2, 4, \dots, 2n$

Example:

Crown graph C_4^+

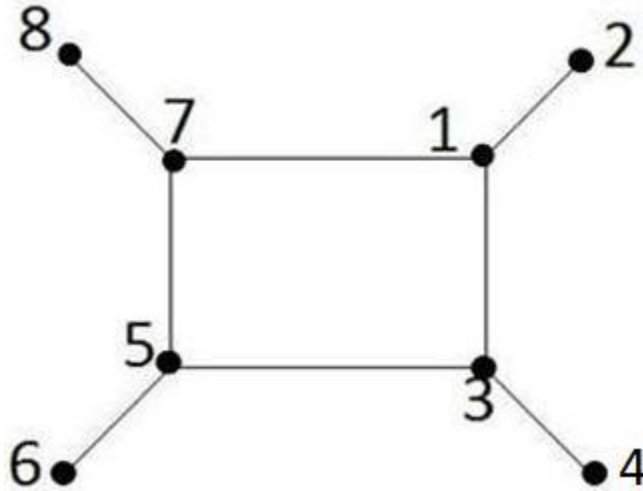


Fig : Crown graph C_4^+

Example:

Crown graph C_5^+

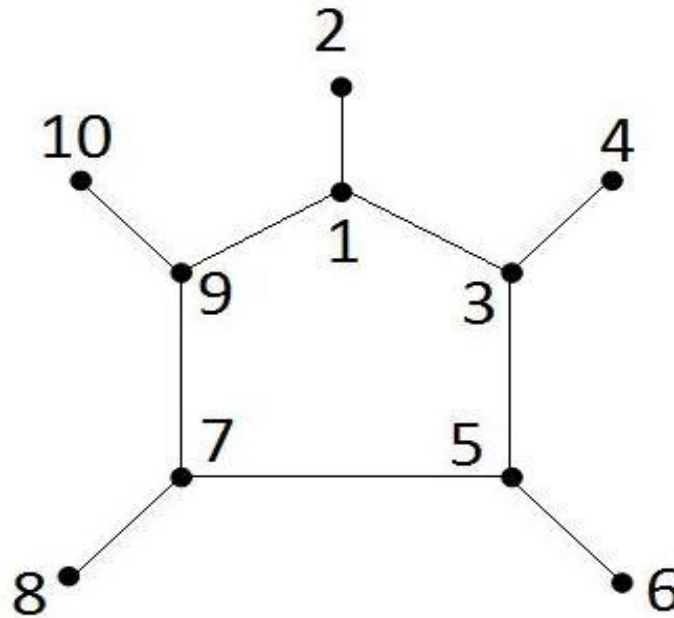


Fig : Crown graph C_5^+

CONCLUSION:

Thus we find the prime labeling of the above mentioned graph. It is of interest to study, prime cordial labeling, prime harmonious labeling, for the classes of graphs like Hamiltonian graphs, Eulerian graphs, Peterson graphs etc.,

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