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Φ-GRACEFUL LABELING OF SOME GRAPHS

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ABSTRACT

L*et G be a graph .The Φ -graceful labeling of a graph $G(V,E)$ with p vertices* ***and*** *q edges is a injective a function $f: V(G) \to \{0,1,2 \dots, n-1\}$ such that the induced function $f^*: E(G) \to N$ is given by $f^*(u,v) = 2\{f(u)+f(v)\}$, the resulting edge labels are distinct. In this paper we prove result Φ – graceful labeling of Thorn ring graph, Cycle (C_n) with twin chords.*

Key Words: *Thorn ring graph, Cycle (C_n) with twin chords.*

1. INTRODUCTION

we begin with all graphs are finite ,simple and undirected graphs. Let $G = (V,E)$ be a graph with vertex set V and edge set E the terminology and notations we follow Harry(2) Graph labeling has wide range of application in radar, communication network (design), x-ray crystallography etc. The definition and other information which are used for the present investigation are given.

2. DEFINITIONS

Definition 2.1: Φ –Graceful graph: A graph $G(V,E)$ with p vertices and q edges is a injective a function $f: V(G) \to \{0,1,2 \dots, n-1\}$ such that the induced function $f^*: E(G) \to N$ is given by $f^*(u,v) = 2\{f(u)+f(v)\}$ Detailed survey on graph labeling is given and up dated by Gallian (1)

3. RESULTS

Theorem 3.1: Every odd cycle graph (C_n) with twin chords is a Φ – graceful graph if $n \geq 7$.

Proof: Let G be a cycle graph (C_n) with twin chords. Let $\{v_1, v_2, v_3, \dots, v_n\}$ be the vertex set and $\{e_1, e_2, e_3, \dots, e_n\}$ be the edge set .Consider $\{e_n\}$ and $\{e_{n-1}\}$ be the chords of the cycle (C_n)

Now we define vertex labeling function as
$f: V(G) \to \{0,1,2 \dots, n-1\}$ such that
$f(v_1) = 0$
$f(v_{3+2i}) = 1+i \quad where \quad i = 0,1,2, \dots, \left\lfloor \frac{n-2}{2} \right\rfloor$
$f(v_{2+2i}) = \left(\frac{n+1}{2}\right)+i \quad where \quad i = 0,1,2, \dots, \left\lfloor \frac{n-2}{2} \right\rfloor$
Where n is the total number of vertices in G.

Continue the labeling until all vertices are labeled as shown in fig (1). Next the edge labeling function is defined as $f^*: E(G) \to N$ is given by $f^*(u,v) = 2\{f(u)+f(v)\}$ we get the edge labels are distinct. Thus f is Φ – graceful of G. Hence cycle (C_n) with twin chords are Φ – graceful graphs

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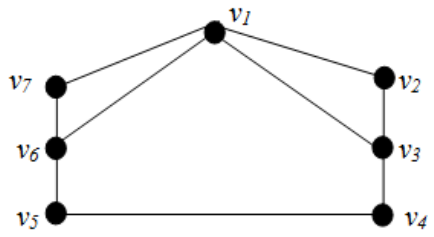

Figure-1

llustration: Φ- Graceful labeling of the graph cycle (C_n) with twin chords is shown in fig.2

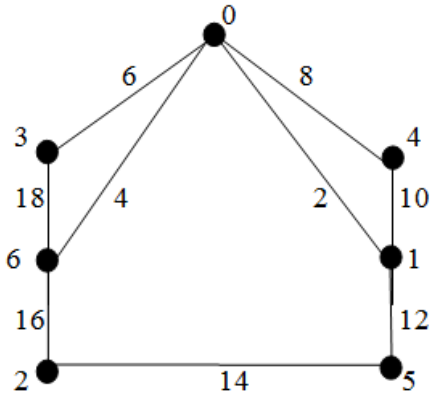

Figure-2

Theorem 3.2: Every odd thorn ring graph is a Φ – graceful graph if $n \geq 3$.

Proof: Let G be a odd thorn ring graph. Let $\{v_1, v_2, v_3, \dots, v_n\}$ be the vertex set and $\{e_1, e_2, e_3, \dots, e_m\}$ be the edge set. Then $|V(G)| = n$ and $|E(G)| = m$

Now label the vertices of a thorn ring define by function as
$f : V(G) \to \{0,1,2 \dots, n-1\}$ Such that
$f(v_1) = 1$
$f(v_2) = 0$
$f(v_{3+2i}) = 2 + i \;\; where \;\; i = 0,1,2, \dots, n-2$
Where n is the total number of vertices in G.

Continue the labeling until all vertices are labeled. Next the edge labeling function is defined as $f^* : E(G) \to N$ is given by $f^*(u,v) = 2\{f(u) + f(v)\}$ we get the edge labels are distinct .Thus f is Φ – graceful of G. Hence cycle (C_n) with twin chords are Φ – graceful graph.

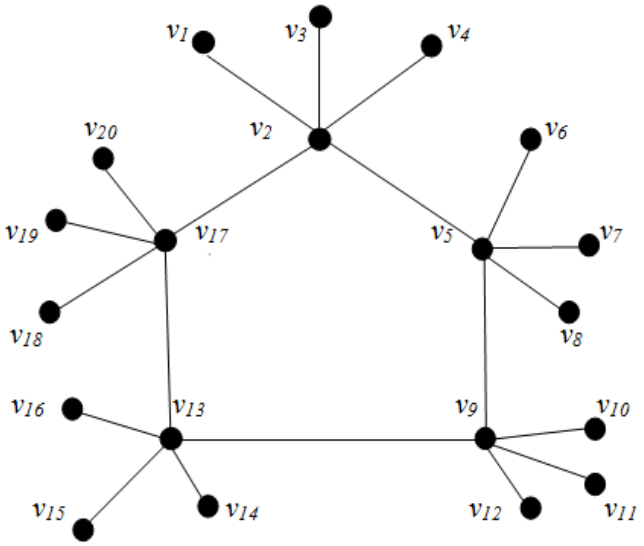

Figure-3

Illustration: Φ- Graceful labeling of the odd thorn ring graph is shown in fig.4

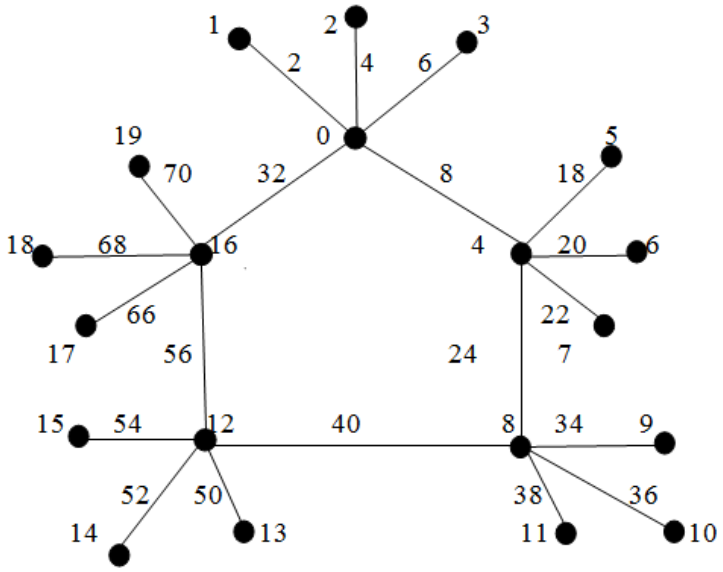

Figure-4

CONCLUSION

In this paper we have shown that Thorn ring graph, Cycle (C_n) with twin chords. are Φ – graceful graph, are investigated it can also verified for some graph**s.**

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