CHAPTER IV

4.1 Introduction

In this chapter we see about barbell graph , friendship graph and path related graph

4.2 Main Results :

4.2.1 BARBELL GRAPH

A barbell (B_n) graph admits an even vertex odd edge root square mean labeling.

Proof:

Let G be a graph B_n where V(G)= $\{u_i$:1≤ $i \leq n\}$ and E(G)={ u_i, u_{i+1}:1≤ $i \leq n-1\}$.

We shall prove that B_n admits an even vertex odd edge root square mean labeling.

A barbell graph B_n is a graph with n vertices $\{u_{1,}u_2,\dots u_n\}$ and n edges $\{u_1u_2, u_2u_3 \dots u_nu_{n+1\}}\}$.

Assign each vertex is an even number f(v_i)=2i, for i=0,1,2,…..n-1.This gives all vertex labels are even.

Each edge e = (v_i,v_{i+1}) is labeled as f(e_i)= $\sqrt{f(v_i)^2 \;\; + f(v_{i+1})^2 \;\; /2 \;\;}$ where f(v_i) and f(v_{i+1}) are the labels of the connected edges.

Since adjacent vertex labels are consecutive even numbers,their squared sum always results in an odd value,ensuring that f(e_i) remains odd.

Hence B_n graph satisfies that the even vertex odd edge root square mean labeling.

FRIENDSHIP GRAPH

A friendship ($\boldsymbol{F_{2n}}$) graph admits an odd vertex even edge root square mean labeling.

Proof

Let G be a graph F_{2n} where V(G)= $\{u_i$:1≤ $i \leq n\}$ and E(G)={ u_i, u_{i+1}:1≤ $i \leq n-1\}$.

We shall prove that F_{2n} admits an odd vertex even edge root square mean labeling.

A friendship F_{2n} is a graph with n vertices $\{u_{1,}u_2,\dots u_n\}$ and n edges $\{u_1u_2, u_2u_3 \dots u_nu_{n+1\}}\}$.

Assign each vertex is an odd number f(v_i)=2i-1, for 1≤i≤n.This gives all vertex labels are odd.

Each edge e = (v_i,v_{i+1}) is labeled as f(e_i)= $\sqrt{f(v_i)^2 \ + f(v_{i+1})^2 \ \ /2}$ where f(v_i) and f(v_{i+1}) are the labels of the connected edges.

Since adjacent vertex labels are consecutive odd numbers,their sum two odd squares is always even.

Hence F_{2n} graph satisfies that the odd vertex even edge root square mean labeling.

PATH RELATED GRAPH

$\boldsymbol{P_n} \ \Theta \ \boldsymbol{K_{1,3}}$ is even vertex odd edge root square mean labeling graph.

Proof:

Let G = $P_n \ \Theta \ K_{1,3}$

Let V(G) = { $u_i, u_i', u_i''; 1 \leq i \ \leq n$ } and E(G) = { $u_i u_i', u_i u_i'', u_i u_i'''; 1 \leq i \ \leq n$ & $u_i u_{i+1}': 1 \leq i \leq n-1$}

Define a map f:V(G)→{0,1,2,…2q} by

f(u_i) = 8i-6 ;1 ≤ i ≤ n

f(u_i')=8(i-1); 1 ≤ i ≤ n

f(u_i'')=8i-4; 1 ≤ i ≤ n

f(u_i''')=8i-2; 1 ≤ i ≤ n

We denote the edge labels are both odd and distinct.

Hence $\boldsymbol{P_n} \ \Theta \ \boldsymbol{K_{1,3}}$ is an even vertex odd edge root square mean labeling.