Sum combination-2 cordial labeling

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Abstract

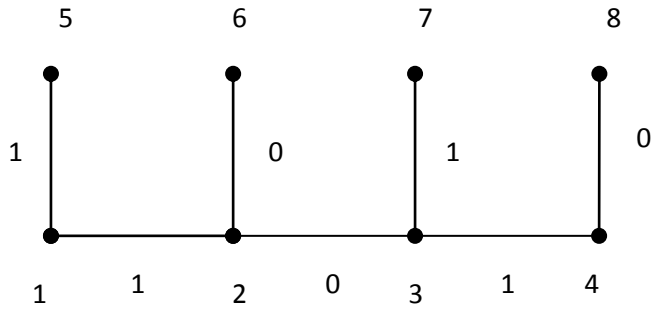
Graphs we are used in this article is simple undirected without multiple edges or loops.Graph labelling is a vast area in research.Labeled graphs are used in various scientific and technical fields.Labeling of a graph is used in various fields like networking, tele - communication, crystallography etc.In this paper the graph is G= (V, E) be a graph with p be the number of vertices and q be the number edges .Graph labeling is an assignment of integers either to the vertices or edges or both of them subject to certain conditions. Many labeling concepts were introduced throughout these years, most techniques were introduced by Rosa [6] in 1967 we can see an excellent survey of graph labelling by Gallian in [2].I.Cahit [1] introduced the concept of cordial labeling as a weaker version of graceful and harmonious labeling. A cordial labeling in which graph takes values $\{0,1\}$ and the edge takes values as the difference $|£(u) - £(v)|$then the number of edges and vertices having values 0 and 1 $|e_£(0) - e_£(1)| \leq 1$ and $|v_£(0) - v_£(1)| \leq 1$ respectively. Then this graph is called cordial graph

Combination is a technique in which we can make maximum possible arrangements of a system,without repetition .Combination can be used in many real life situation also.Combination labeling was introduced by hedge et.al in [3] as there exists a bijection £ : V (G) → {1, 2, 3, ..., p} such that the induced edge function g : E(G) → N defined as ,$g(uv) = \begin{cases} £(u)C_{£(v)}, & if\ £(u) > £(v) \\ £(v)C_{£(u)}, & if\ £(v) \geq £(u) \end{cases}$is injective, where $£(u)C_{£(v)}$ is the number of combinations of f(u) things taken £(v) at a time. Such a labeling £ is called combination labeling of G.They also proved many graphs holding this property .

In [4] R .Ponraj et.al introduced the concept of parity combination cordial labelling. For each edge uv, assign the label $\binom{u}{v}$ or $\binom{v}{u}$ according as u >v or v > u. £ is called a parity combination cordial labeling (PCC-labeling) if f is a one to one map and $|e_£(0) - e_£(1)| \leq 1$ where $e_£(0)$ and $e_£(1)$ denote the number of edges labeled with an even number and odd number, respectively. Mohamed Seoud et.al[4] later developed this labelling technique to some more graphs.we can see different kind of graphs holding this techniques in this articles.

Taking inspiration from these techniques we are considering the sum of two function holds the cordial labelling.Now we are taking the possibilities of a particular function sum combination- 2 in cordial labeling.We are also checking the possibilities of the graphs holding this labelling. The sum combination -2 labeling of the graph G=(p,q) be a graph and the function £:V(G)→p is an bijective mapping has the value $\binom{u+v}{2}$ and the condition $|e_£(0) - e_£(1)| \leq 1$,where $e_£(0)$ is the number of edges labeled with even numbers and $e_£(1)$ is the number of edges labelled with odd numbers.Then it is called sum combination-2 cordial labelling and the graph is called sum combination-2 cordial graph. Below we can see a graph $P_n \odot K_1$ holding the sum combination-2 labeling.

Now we are taking certain graphs that hold sum combination-2 labeling technique.



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