ISOTOPIC AND GENETIC GRAPHS

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Abstract

We define new graphs, if two or more graphs are having same number of vertices, same number of edges, but different from each other in weight is called an Isotopic graphs And if two or more graphs are having same number of vertices, same number of edges and same number of weights, then these graphs are called Genetic graphs. The purpose of this is to give small flavor to graph theory and to hint at its utility as a particular practical problem-solving tool in a variety fields.

Keywords: Isomorphic, Isotopic

Subject Classification: 05C78

Introduction

All graphs considered here finite, nonempty, weighted, connected undirected, without loop and multiple edges, without isolated vertex. We follow the notation and terminology given by Harary [1].

Two graphs G_1 and G_2 are said to be *Isomorphic* if there is a one-to–one mapping from $V(G_1)$ onto $V(G_2)$ such that uv is an edge of G_1 if and only if $f(u), f(v)$ is an edge of G_2. A mapping f is called an *isomorphism* between G_1 and G_2. If G_1 and G_2 are isomorphic, then we write $G_1 = G_2$. It is clear that if two graphs are isomorphic, then they have the same number of vertices, the same number of edges and equal number o vertices with a given degree. But the converse is not true always [1].

Among many ways of assigning weights to the edges of a graph are those that are functions of the degrees of the vertices of a given edge $e = \{u, v\}$. Such weightings are of interest since the vertex degrees of a graph are intrinsic to the structure of the graph. One of the most natural of such weightings is defined as

$w(e) = \deg(u) + \deg(v)$,

and extended to the *weight of a graph* $G = (V(G), E(G))$

as $w(G) = \sum w(e)$, $e \in E(G)$ where, $E(G)$ is the edge set of G.

In general, the *order* $V(G)$ of G is denoted by p and the *size* $E(G)$ of G by q. The weighting $w(e)$ was studied by Mallikarjun B Kattimani, DuCasse, Gargano, and Quintas in [2], [4]. An indispensible reference for the study of graph labeling is the survey by Gallian [3] in which a wide variety of graph labeling definitions, results, and problems are covered and regularly updated.

Here, we initiatea study of this new parameter *Isotopic* and *Genetic* graphs. The fact that children resemble their parents is an example of heredity. The cats have kittens, dogs have pups, and people have babies. Within these groups the specific hereditary traits of the parents are found to varying degrees in the children. The mechanism of heredity is signified by the modern term genetics. Here two or more graphs are resembles in their characters, may be slightly differ in some characters then these are the same family of graphs, so we define *Genetic* and *Isotopic* graphs.

Isotopic graphs

We define, if two or more graphs are having same number of vertices, same number of edges, but different from each other in weight is called an *Isotopic* graphs.

Genetic graphs

If two or more graphs are having same number of vertices, same number of edges and same number of weights, then these graphs are called *Genetic* graphs, and also are called as “Gipees”.

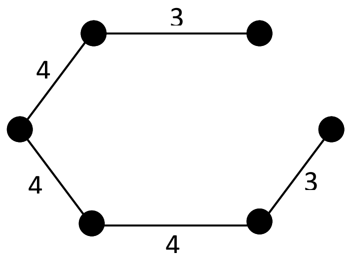
The purpose of this paper is to develop a more exhaustive graph theoretical model of An isotopic tracer, (also "isotopic marker" or "isotopic label"), is used in chemistry and biochemistry to help understand chemical reactions and interactions and genetic divergence of DNA studies and these models are used to study both the frequency and the mechanism of genetic processes and also play an increasingly important role in genetic theory. Forensic analysis of scene-of-crime samples, medical diagnosis, biotechnology industry, and also electronics network design analysis. In the field of VLSI design, Four –Bit X Four-Bit Multiplier, Pictured is a CMOS cellular array of a 4-bit x 4-bit multiplier circuit.

2. New Results

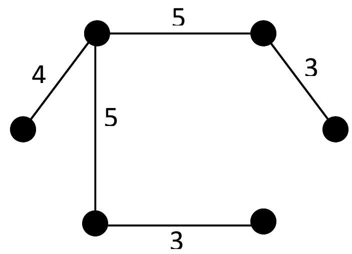
2.1 Isotopic graphs

If two or more graphs are having same number of vertices, same number of edges, but different from each other in weight is called as *Isotopic* graphs. In which the graph is having minimum weight is called *minimum isotopic graphs (mig). The isotopic number* is the total number of isotopic graphs.

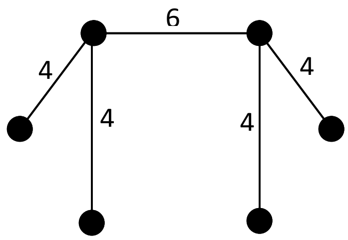
The following all graph with p=6 vertices and q=5 edges



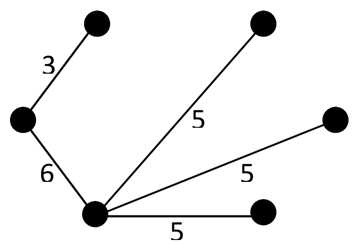
w(G₁)=18



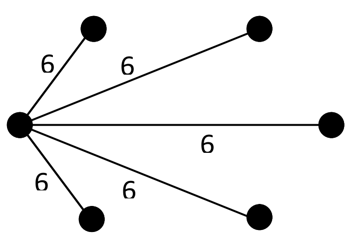
w(G₂)=20



$w(G_3)=22$



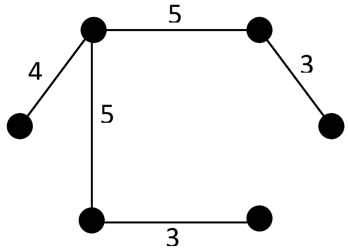
$w(G_4)=24$



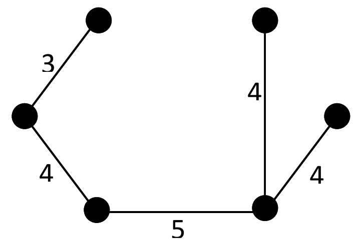
$w(G_5)=30$

2.2 Genetic graphs

If two or more graphs are having same number of vertices, same number of edges and same number of weights, then these graphs are called *Genetic* graphs and also called as gipees. *Genetic number* is the total number of graphs in gipees. *The genetic set* is the group of gipees. *The genetic set number* is the number of groups of gipees. The *family of genetics graphs* is the total number of gipees in a genetic set.
The following all graph with p=6 vertices and q=5 edges



w(G_1)=20



w(G_2)=20

In the above graphs G_1 and G_2 are genetic graphs and these graphs are not isomorphic.

Note:

1. Genetic graphs are not isomorphic.
2. Some genetics graphs are having different domination number.

Results

Proposition 1. For any isotopic graph with $p\ vertices$, $(p-1)\ edges$ with $(p^2-p)\ weight$ is a star.

Theorem 2. For every isotopic graphs are with $p\ vertices$ and $\left((p-2),\left(\frac{p^2-p-2}{2}\right)\right)\ edges$. Other than these edges is a non-isotopic graph.

4. References

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