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FACTORIZATION OF COMPLETE GRAPH AND ITS APPLICATION

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Abstract:

Factorization of a graph G is a set of spanning subgraphs of G that are pairwise edge disjoint. A graph is called k -factorizable if it can be represented as a union of edge-disjoint k factors. In this paper we obtain factorization of complete graph and its application.

AMS Subject Classification: 05C69

Keywords: factorization, factors

1. Introduction

Graphs are the mathematical structure which consists of vertex set V and edge set E . It is used to model pair-wise relation between objects from a certain collection. Vertices are represented as points in the plane edges are represented as the line segments connecting them. Graphs are ever-present miniature of both from nature and man-made structures.

When any two vertices are joined by more than one edge, the graph is called a multi-graph. A graph without loops and with at most one edge between any two vertices is called a simple graph. Unless stated otherwise, graph is assumed to refer a simple graph. When each vertex connected by an edge to every other vertex, the graph is called a complete graph.

If two graphs G_1 and G_2 have the same vertex set, then the union $G_1 \cup G_2$ has the same vertex set and the edge set $E(G_1 \cup G_2)$ is $E(G_1) \cup E(G_2)$. If $E(G_1) \cap E(G_2) = \emptyset$ then $E(G_1) \cup E(G_2)$ may be termed the edge-disjoint union of $E(G_1)$ and $E(G_2)$. If two graphs G_1 and G_2 have disjoint vertex sets then the union of G_1 and G_2 is $V(G_1 \cup G_2) = V(G_1) \cup V(G_2)$. Partition [7] of G into edge - disjoint sub-graphs G_1, G_2, \dots, G_r such that $E(G) = E(G_1) \cup E(G_2) \cup \dots \cup E(G_r)$ is called decomposition of G and we write $G = G_1 \oplus G_2 \oplus \dots \oplus G_r$.

If every pair of vertices are joined by an edge, we say that the graph is complete and if, in addition, $|V(G)| = n$, we denote this graph by K_n .

There is a vast body of work on factors and factorizations and this topic has much in common with other areas of study in graph theory. For example, factorization significantly