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COMMON MULTIPLES OF PATH, STAR AND CYCLE WITH COMPLETE BIPARTITE GRAPHS

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Abstract: A graph G is a common multiple of two graphs H_1 and H_2 if there exists a decomposition of G into edge-disjoint copies of H_1 and also a decomposition of G into edge-disjoint copies of H_2. If G is a common multiple of H_1 and H_2, and G has q edges, then we call G a (q, H_1, H_2) graph. Our paper deals with the following question: Given two graphs H_1 and H_2, for which values of q does there exist a (q, H_1, H_2) graph? when H_1 is either a path or a star or a cycle and H_2 is a complete bipartite graph.

Keywords and Phrases: Graph Decomposition, Common Multiples of Graphs, Path, Star, Cycle, Complete Bipartite Graph.

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1. Introduction

All graphs considered here are finite and undirected unless otherwise noted. Let $|V(G)|$ and $e(G)$ denote, respectively, the order of a graph G and the size of G, that is, the number of edges in G.

K_n denotes the complete graph on n vertices, and $K_{m,n}$ denotes the complete bipartite graph with vertex partitions of cardinality m and n. A *k-path*, denoted