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On Potentially Graphical Sequences of $G-E(H)$

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Abstract. A loopless graph on n vertices in which vertices are connected at least by a and at most by b edges is called a (a,b,n)-*graph*. A (b,b,n)-*graph* is called (b,n)-*graph* and is denoted by K_n^b (it is a complete graph), its complement by $\overline{K}_n^b$. A non increasing sequence $\pi=(d_1,\cdots,d_n)$ of nonnegative integers is said to be (a,b,n) graphic if it is realizable by an (a,b,n)-graph. We say a simple graphic sequence $\pi=(d_1,\cdots,d_n)$ is potentially $K_4-K_2\cup K_2$-graphic if it has a a realization containing an $K_4-K_2\cup K_2$ as a subgraph where K_4 is a complete graph on four vertices and $K_2\cup K_2$ is a set of independent edges. In this paper, we find the smallest degree sum such that every n-term graphical sequence contains $K_4-K_2\cup K_2$ as subgraph.

Key Words: Graph, (a,b,n)-*graph*, potentially graphical sequences.

AMS Subject Classifications: 05C07

1 Introduction

Let $G(V,E)$ be a simple graph (a graph without multiple edges and loops) with n vertices and m edges having vertex set $V(G)=\{v_1,v_2,\cdots,v_n\}$. The set of all non-increasing non-negative integer sequences $\pi=(d_1,d_2,\cdots,d_n)$ is denoted by NS_n. A sequence $\pi\in NS_n$ is said to be graphic if it is the degree sequence of a simple graph G on n vertices, and such a graph G is called a realization of π. The set of all graphic sequences in NS_n is denoted by GS_n. There are several famous results, Havel and Hakimi [7,8] and Erdös and Gallai [2] which give necessary and sufficient conditions for a sequence $\pi=(d_1,d_2,\cdots,d_n)$ to be the degree sequence of a simple graph G. Another characterization of graphical sequences can be seen in Pirzada and Yin Jian Hu [15]. A graphical sequence π is potentially H-graphical if there is a realization of π containing H as a subgraph, while π is forcibly H graphical if every realization of π contains H as a subgraph. A sequence $\pi=(d_1,d_2,\cdots,d_n)$

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