## KRAGUJEVAC JOURNAL OF MATHEMATICS VOLUME 38(1) (2014), PAGES 73–81.

## POTENTIALLY GRAPHIC SEQUENCES OF SPLIT GRAPHS

S. PIRZADA<sup>1</sup> AND BILAL A.  $CHAT^2$ 

ABSTRACT. A sequence  $\pi = (d_1, d_2, \ldots, d_n)$  of non-negative integers is said to be graphic if it is the degree sequence of a simple G on n vertices, and such a graph G is referred to as a realization of  $\pi$ . The set of all non-increasing non-negative integer sequences  $\pi = (d_1, d_2, \ldots, d_n)$  is denoted by  $NS_n$ . A sequence  $\pi \in NS_n$  is said to be graphic if it is the degree sequence of a graph G on n vertices, and such a graph G is called a realization of  $\pi$ . The set of all graphic sequences in  $NS_n$  is denoted by  $GS_n$ . A split graph  $K_r + \overline{K_s}$  on r + s vertices is denoted by  $S_{r,s}$ . A graphic sequence  $\pi$  is potentially H-graphic if there is a realization of  $\pi$  containing H as a subgraph. In this paper, we determine the graphic sequences of subgraphs H, where H is  $S_{r_1,s_1} + S_{r_2,s_2} + S_{r_3,s_3} + \ldots + S_{r_m,s_m}$ ,  $S_{r_1,s_1} \vee S_{r_2,s_2} \vee \ldots \vee S_{r_m,s_m}$  and  $S_{r_1,s_1} \times S_{r_2,s_2} \times \ldots \times S_{r_m,s_m}$  and +, V and  $\times$  denotes the standard join operation, the normal join operation and the cartesian product in these graphs respectively.

## 1. INTRODUCTION

Let G be an undirected simple graph (graph without multiple edges and loops) with n vertices and m edges having vertex set  $V(G) = \{v_1, v_2, \ldots, v_n\}$ . Any undefined notations follows that of Bondy and Murty [1]. Throughout the paper, we denote such a graph by G(n, m). The set of all non-increasing non-negative integer sequences  $\pi = (d_1, d_2, \ldots, d_n)$  is denoted by  $NS_n$ . There are several famous results, Havel and Hakimi [5, 6] and Erdös and Gallai [3] which give necessary and sufficient conditions for a sequence  $\pi = (d_1, d_2, \ldots, d_n)$  to be the degree sequence of a simple graph G. Unfortunately, knowing that a sequence has a realization gives no information about the properties of a graph which is related to work originally introduced by A. R. Rao [9]. 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  $\pi$ . The sequence

Key words and phrases. Graph, Split graph, Potentially H-graphical sequences.

<sup>2010</sup> Mathematics Subject Classification. Primary: 05C07.

Received: October 24, 2013

Revised: November 19, 2013.