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# Minimum rank and path cover number for generalized and double generalized cycle star graphs

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## Abstract

For a given connected (undirected) graph  $G = (V, E)$ , with  $V = \{1, \dots, n\}$ , the minimum rank of  $G$  is defined to be the smallest possible rank over all symmetric matrices  $A = [a_{ij}]$  such that for  $i \neq j$ ,  $a_{ij} = 0$  if, and only if,  $\{i, j\} \notin E$ . The path cover number of  $G$  is the minimum number of vertex-disjoint paths occurring as induced subgraphs of  $G$  that cover all the vertices of  $G$ . When  $G$  is a tree, the values of the minimum rank and of the path cover number are known as well the relationship between them. We study these values and their relationship for all graphs that have at most two vertices of degree greater than two: generalized cycle stars and double generalized cycle stars.

AMS classification: 05C50; 15A03; 15A18

Keywords: Graphs; Minimum rank; Path cover number; Maximum multiplicity; Symmetric matrices; Cycle; Generalized star; Generalized cycle star; Double generalized cycle star.

## 1 Introduction

Let  $G = (V, E)$  be a simple, connected and undirected graph with vertex set  $V = \{1, \dots, n\}$  and edge set  $E$ .

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