

GEODETIC HUB NUMBER OF GRAPHS

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Abstract: A subset S of vertex set $V(G)$ of a graph G of order $n \geq 2$ is a geodetic hub set of G if S is both a geodetic set and a hub set of G . The minimum cardinality of a geodetic hub set of G is called the geodetic hub number of G , denoted by $h_{geo}(G)$. In this paper, we initiate the study of geodetic hub number of a graph. The geodetic hub number of several classes of graphs are determined and its value for some graph operations are studied.

Keywords and Phrases: Hub set, Hub number, Geodetic set, Geodetic number.

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1. Introduction

By a graph $G = (V, E)$ we mean a simple, connected undirected graph without loops and multiple edges. $|V(G)| = n$ and $|E(G)| = m$ denote number of vertices and edges of G , respectively. The distance $d(u, v)$ between two vertices u and v in G is the length of the shortest path joining them. The shortest $u - v$ path is called a geodesic. The diameter of a graph is the length of any longest geodesic, denoted by $d(G)$. For basic graph terminology and definitions not given here we refer Harary F., [3].

A vertex v is extreme vertex of G if the subgraph induced by its neighbors is a complete graph. This was introduced in Everett M. G., and Seidman S. B., [2]. The geodetic closure of a vertex set $S \subset V(G)$ is the set of all vertices $u \in V(G)$ which lie in some geodesic in G joining two vertices x and y of S . The geodetic number