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The Mole Plough Domination in Graphs

Alyaa A. Alwan **Alaa A. Najim**
alyaaathab@gmail.com
Department of Mathematics College of Sciences Basra University, Basra, Iraq

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Abstract

In this paper, we initiate the study of mole plough domination , consider $G = (V, E)$ be a simple, finite, and undirected graph without isolated vertex. A mole plough dominating set is a set $D \subseteq V(G)$ where, every vertex in D dominates at least 2 and at most 3 vertices of $V - D$. The domination number of G, denotes $\Upsilon_{mf}(G)$ is the smallest cardinality of the minimum mole plough dominating set in G. We determine best possible upper and lower bounds for $\Upsilon_{mf}(G)$, discussed for several standard graphs such as : complete, complete bipartite and wheel graphs. Also, we study the inverse mole plough domination number.

Keywords: Dominating set; mole plough domination; minimum mole plough domination; inverse mole plough domination.

1.Introduction

Terms related to graph theory that are not covered here can be found in [1]. Let $G = (V, E)$ be a graph. For every vertex $v \in V$, The open neighborhood of v, denoted by $N(v)$, is defined by $\{u \in V, uv \in E\}$, and the set $N[v] = N[v] \cup \{v\}$ is a closed neighborhood. The complement graph $\bar{G}$ of a simple graph G If and only if two vertices in graph G are not neighboring, then they are adjacent in graph G . We use the terms from [2, 4], for graph terminology. One of the areas of graph theory that is expanding the fastest is the study of dominance problems. For a thorough analysis of dominance, see [5,6]. If every vertex in $V - D$ is adjcent to a vertex in D , then, a set $D \subseteq V(G)$ is a dominating set; if D has no dominating subset, then, it is a minimal dominating set. The minimum cardinality of a dominating set D of G is known as the domination number $\gamma(G)$.

Here, the mole plough domination model of graph is shown. There are limits on the mole plough domination number related to a graph's order, size, minimum degree, maximum degree, and other attributes. mole plough domination is applied for a few modified and known graphs.