k-STRONG DEFENSIVE ALLIANCES IN GRAPHS

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Abstract: In a simple connected graph $G = (V, E)$, a subset S of V is a defensive alliance if every vertex $v \in S$ has at most one more neighbour in $V - S$ than it has in S. The minimum cardinality of a defensive alliance in G is called the defensive alliance number of G, denoted by $a(G)$. A k-strong defensive alliance S is a defensive alliance in G, in which removal of any set of at most k vertices does not affect its defensive property. The k-strong defensive alliance number of G is the minimum cardinality of a k-strong defensive alliance in G, denoted by $a^k(G)$. In this paper, some properties of k-strong defensive alliances are discussed and the k-strong defensive alliance numbers of some classes of graphs are obtained.

Keywords and Phrases: Alliances, Strong Defensive Alliances, Defensive Alliance Number.

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1. Introduction

The notion of alliances are introduced by Kristiansen et al. in [9]. Let $G = (V, E)$ be a simple connected graph and $\emptyset \subset S \subseteq V$. For any $v \in V$, $N(v) =$