



THE AVERAGE LOWER INDEPENDENCE NUMBER OF TOTAL GRAPHS

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Received July 21, 2013; Re-revised July 11, 2018

Abstract

In communication networks, “vulnerability” indicates the resistance of a network to disruptions in communication after a breakdown of some processors or communication links. We may use graphs to model networks, as graph theoretical parameters can be used to describe the stability and reliability of communication networks. If we think of a graph as modeling a network, the average lower independence number of a graph is one measure of graph vulnerability.

For a vertex v of a graph $G = (V, E)$, the lower independence number $i_v(G)$ of G relative to v is the minimum cardinality of a maximal independent set of G that contains v . The average lower independence number of G , denoted by $i_{av}(G)$, is the value $\frac{1}{|V(G)|} \sum_{v \in V(G)} i_v(G)$. In this paper, we defined and examined this parameter and considered the average lower independence number of special graphs and theirs total graphs.

Keywords and phrases: vulnerability, connectivity, graph theory, total graph, average lower independence number.

Pioneer Journal of
Algebra, Number
Theory and its
Applications



Pioneer Scientific
Publisher