Connected geodomination in graphs

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Abstract

A pair \(x, y\) of vertices in a nontrivial connected graph \(G\) is said to geodominate a vertex \(v\) of \(G\) if either \(v \in \{x, y\}\) or \(v\) lies in an \(x – y\) geodesic of \(G\). A set \(S\) of vertices of \(G\) is a geodominating set if every vertex of \(G\) is geodominated by some pair of vertices of \(S\). A vertex of \(G\) is link-complete if the subgraph induced by its neighborhood is complete. A pair \(x, y\) of vertices in \(G\) is said to openly geodominate a vertex \(v\) of \(G\) if \(v \neq x, y\) and \(v\) is geodominated by \(x\) and \(y\). A set \(S\) is an open geodominating set of \(G\) if for each vertex \(v\), either (1) \(v\) is link-complete and \(v \in S\) or (2) \(v\) is openly geodominated by some pair of vertices of \(S\). A connected geodominating set is a geodominating set which is connected. The cardinality of a minimum connected geodominating set in \(G\) is its connected geodomination number \(g_c(G)\). For a minimum connected geodominating set \(S\) of \(G\), a subset \(T \subseteq S\) is said to be a forcing set if \(S\) is the unique connected geodominating set containing \(T\). The forcing connected geodomination number \(f(G, g_c(G))\) is the minimum size of a forcing connected geodominating set among the forcing connected geodominating sets of \(G\). We study (open) connected geodomination number and forcing connected geodomination number in a graph \(G\).

Keywords: Geodomination, forcing geodomination.

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Journal of Discrete Mathematical Sciences & Cryptography
Vol. 9 (2006), No. 1, pp. 177–186
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