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THE GEODETIC FAULT TOLERANT DOMINATION NUMBER OF A GRAPH

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Abstract: For a connected graph $G = (V, E)$, a set $F \subseteq V$ of vertices in G is called dominating set if every vertex not in F has at least one neighbor in F. A dominating set $F \subseteq V$ is called fault tolerant dominating set if $F - \{v\}$ is dominating set for every $v \in F$. A fault tolerant dominating set is said to be geodetic fault tolerant dominating set if $I[F] = V$. The minimum cardinality of a geodetic fault tolerant dominating set is called geodetic fault tolerant domination number and is denoted by $\gamma_{gft}(G)$. The minimum geodetic fault tolerant dominating set is denoted by γ_{gft}-set. The geodetic fault tolerant domination number of certain classes of graphs are determined. Some general properties satisfied by this concept are studied. It is shown that for every positive integer $2 < a \leq b$ there is a connected graph G such that $\gamma(G) = a$, $\gamma_g(G) = b$ and $\gamma_{gft}(G) = a + b - 2$, where $\gamma(G)$ and $\gamma_g(G)$ are the domination number and geodetic domination number of G respectively.

Keywords and Phrases: Domination number, Fault Tolerant domination number, Geodetic number, Geodetic fault tolerant number.

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