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TOTAL STEINER DECOMPOSITION NUMBER OF GRAPHS

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Abstract: For a connected graph G, a decomposition $\pi = \{G_1, G_2, ..., G_n\}$ is called a total Steiner decomposition if $s_t(G_i) = s_t(G)$ for $1 \leq i \leq n$. The maximum cardinality obtained for the total Steiner decomposition π is said to be total Steiner decomposition number of G and is denoted by $\pi_{tst}(G)$. In this paper, we present some properties of $\pi_{tst}(G)$. Also it is shown that for every pair of positive integers m, n with $m \geq 4$, there exists a connected graph G such that $s_t(G) = m$ and $\pi_{tst}(G) = n$.

Keywords and Phrases: Total Steiner number, total Steiner decomposition number, Realization theorem.

2020 Mathematics Subject Classification: 05C12, 05C99.

1. Introduction and Preliminaries

Let $G = (V, E)$ be a simple, connected and undirected graph of order p and size q. Steiner number of a graph is introduced by Chartrand and Zhang [1]. Further studies on this concept is carried out in [7], [8]. Total Steiner number is a concept which is introduced by John [3]. In this paper, we introduce the concept of total Steiner decomposition number of graphs.