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On upper traceable numbers of graphs. (English) Zbl 1199.05095

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Summary: For a connected graph G of order $n \geq 2$ and a linear ordering s $v_1, v_2, \dots, v_n$ of vertices of G, $d(s) = \sum_{i=1}^{n-1} d(v_i, v_{i+1})$, where $d(v_i, v_{i+1})$ is the distance between v_i and v_{i+1}. The upper traceable number $t^+(G)$ of G is $t^+(G) = \max\{d(s)\}$, where the maximum is taken over all linear orderings s of vertices of G. It is known that if T is a tree of order $n \geq 3$, then $2n-3 \leq t^+(T) \leq \lfloor n^2/2 \rfloor - 1$ and $t^+(T) \leq \lfloor n^2/2 \rfloor - 3$ if $T \neq P_n$. All pairs n, k for which there exists a tree T of order n and $t^+(T) = k$ are determined and a characterization of all those trees of order $n \geq 4$ with upper traceable number $\lfloor n^2/2 \rfloor - 3$ is established. For a connected graph G of order $n \geq 3$, it is known that $n-1 \leq t^+(G) \leq \lfloor n^2/2 \rfloor - 1$. We investigate the problem of determining possible pairs n, k of positive integers that are realizable as the order and upper traceable number of some connected graph.

MSC:

05C12 Distance in graphs
05C45 Eulerian and Hamiltonian graphs

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traceable graph; traceable number; upper traceable number

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