

Color-disjoint rainbow spanning trees of edge-colored graphs

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For any $t \geq 1$ and an edge-colored multigraph G , we show that G has t color-disjoint rainbow spanning trees if and only if for any partition P of $V(G)$, there are at least $t(|P| - 1)$ distinct colors occurring in the crossing edges of P . Our theorem generalizes two previous results: Nash-Williams-Tutte theorem and Schrijver's theorem. As an application, we resolve a conjecture of Jahanbekam and West: $r(n, t) = \binom{n-2}{2} + t$ whenever $n \geq 2t + 2 \geq 6$. Here $r(n, t)$ is the maximum number of colors in an edge-coloring of K_n not having t edge-disjoint rainbow spanning trees.

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