THE SUPER-CONNECTIVITY OF KNESER GRAPHS

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Abstract

A vertex cut of a connected graph $G$ is a set of vertices whose deletion disconnects $G$. A connected graph $G$ is super-connected if the deletion of every minimum vertex cut of $G$ isolates a vertex. The super-connectivity is the size of the smallest vertex cut of $G$ such that each resultant component does not have an isolated vertex. The Kneser graph $K_G(n, k)$ is the graph whose vertices are the $k$-subsets of $\{1, 2, \ldots, n\}$ and two vertices are adjacent if the $k$-subsets are disjoint. We use Baranyai’s Theorem on the decompositions of complete hypergraphs to show that the Kneser graph $K_G(n, 2)$ are super-connected when $n \geq 5$ and that their super-connectivity is $\left(\begin{array}{c}n \\ 2 \end{array}\right) - 6$ when $n \geq 6$.

Keywords: connectivity, super-connectivity, Kneser graphs.

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References


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