

Interval edge colorings of Hamming graphs

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An edge-coloring of a graph G with colors $1, \dots, t$ is an interval t -coloring if all colors are used, and the colors of edges incident to each vertex of G are distinct and form an interval of integers. A graph G is interval colorable if it has an interval t -coloring for some positive integer t . For an interval colorable graph G , the least and the greatest values of t for which G has an interval t -coloring are denoted by $w(G)$ and $W(G)$, respectively.

Hamming graph $H(n_1, \dots, n_k)$ is defined as a Cartesian product of complete graphs $K_{n_1} \square \dots \square K_{n_k}$. Hamming graph $H(n_1, \dots, n_k)$ is interval colorable if and only if $n_1 \cdot \dots \cdot n_k$ is even. If $H(n_1, \dots, n_k)$ is interval colorable, then $w(H(n_1, \dots, n_k))$ is equal to its maximum degree and for every t between $w(H(n_1, \dots, n_k))$ and $W(H(n_1, \dots, n_k))$ it has an interval t -coloring. The exact value of $W(H(n_1, \dots, n_k))$ is not known even in the case $k = 1$. In this talk we present improved upper and lower bounds on $W(H(n_1, \dots, n_k))$.¹

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