

The Neighbour Sum Distinguishing Relaxed Edge Colouring

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A k -edge colouring of a graph with colours in $\{1, 2, \dots, k\}$ is neighbour sum distinguishing if, for any two adjacent vertices, the sums of the colours of the edges incident with each of them are distinct. It can easily be observed that every connected graph different from K_2 admits neighbour sum distinguishing edge coloring. A graph is nice if it has no components isomorphic to K_2 . We consider the neighbour sum distinguishing edge colouring in which each monochromatic set of edges induces a subgraph with maximum degree at most d . We call such an edge colouring a neighbour sum distinguishing d -relaxed k -edge colouring. We denote by $\chi_{\Sigma}^d(G)$ the smallest value of k such that such a colouring of G exists. Note that, for $d = 1$ and $d = \Delta(G)$, we obtain the neighbour sum distinguishing edge coloring related with two famous conjectures: the 1-2-3 Conjecture states that $\chi_{\Sigma}^{\Delta(G)}(G) \leq 3$ for any nice graph G ([2]); and the other states that $\chi_{\Sigma}^1(G) \leq \Delta(G) + 2$ for any nice graph $G \neq C_5$ ([1]).

References

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