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Rainbow subgraphs in edge-colorings of complete graphs. (In English)

Gimbel, John (ed.) et al., Quo vadis, graph theory? A source book for challenges and directions. Amsterdam: North-Holland, Ann. Discrete Math. 55, 81-88 (1993). [ISBN 0-444-89441-1/hbk]

We raise the following problem. Let F be a given graph with e edges. Consider the edge colorings of K_n (n large) with e colors, such that every vertex has degree at least d in each color ($d < n/e$). For which values of d does every such edge coloring contain a subgraph isomorphic to F , all of whose edges have distinct colors? The case when F is the triangle K_3 is well-understood, but for other graphs F many interesting questions remain open, even for d -regular colorings when $n = de + 1$.

Classification:

05C15 Chromatic theory of graphs and maps

Keywords:

rainbow subgraphs; complete graphs; edge colorings