
Zbl 789.11007
Bollobás, Béla; Erdős, Paul; Jin, Guoping
Ramsey problems in additive number theory. (In English)
Acta Arith. 64, No.4, 341-355 (1993). [0065-1036]

Let $f_k(n)$ be the minimal integer m such that, for any decomposition of the set $\{1, \ldots, m\}$ into k (disjoint) classes, n is the sum of distinct terms of one of them. Similarly, let $g_k(n)$ be the smallest integer m such that there is a set $A \subseteq \{1, 2, \ldots, n-1\}$ with $m = \sum_{a \in A} a$ such that, for any partition of A into k classes, n is always the sum of elements of one of them. The authors prove that for all suffciently large n,

$$[2\sqrt{n}] + 2 \leq f_2(n) \leq [2\sqrt{n} + \log_{5/4} n + 8]$$

and $\sqrt{2n}/8 \leq g_2(n) - 2n \leq 3\sqrt{n} \log_{5/4} n$, with the lower bound for $g_2(n)$ holding even for all $n \geq 3$.

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Classification:
11B13 Additive bases
05D05 Extremal set theory

Keywords:
sum-sets; additive representations; Ramsey problems