$L(h, 1)$-Labeling of Circulant graphs

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An $L(h, 1)$-labeling of a graph Γ is an assignment of non-negative integers to the vertices such that if two vertices u and v are adjacent then they receive labels that differ by at least h, and when u and v are not adjacent but there is a two-hop path between them, then they receive labels that differ by at least one. The span λ of such a labeling is the difference between the largest and the smallest vertex labels assigned. Let $\lambda_h^1(\Gamma)$ denote the least λ such that Γ admits an $L(h, 1)$-labeling using labels from $\{0, 1, \ldots, \lambda\}$. A Cayley graph of group G is called circulant graph of order n, if $G = Z_n$. In this paper initially we investigate the $L(h, 1)$-labeling for circulant graphs with "large" connection sets, and then we extend our observation and find the span of $L(h, 1)$-labeling for any circulants of order n.