The concept of L(2,1)-labeling in graph come into existence with the solution of frequency assignment problem. In fact, in this problem a frequency in the form of nonnegative integers is to assign to each radio or TV transmitters located at various places such that communication does not interfere. This frequency assignment problem can be modeled with vertex labeling of graphs. An L(2,1)-labeling (or distance two labeling) of a graph G is a function f from the vertex set V(G) to the set of all nonnegative integers such that |f(u)−f(v)|≥2 if d(u,v)=1 and |f(u)−f(v)|≥1 if d(u,v)=2, where d(u,v) denotes the distance between u and v in G. The L(2,1)-labeling number λ(G) of G is the smallest number k such that G has an L(2,1)-labeling with max {f(v):v ϵ V(G) }=k. In this paper, upper bound for the L(2,1)-labeling number for the γ-product of two graphs has been obtained in terms of the maximum degrees of the graphs involved and improved this bound by using a dramatically new approach on the analysis of the adjacency matrices of the graphs. By the new approach, we have achieved more accurate result with significant improvement of this bound.
References

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