

Total Vertex Irregular Labeling of Complete Bipartite Graphs

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Abstract. A total vertex irregular labeling of a graph G with v vertices and e edges is an assignment of integer labels to both vertices and edges so that the weights calculated at vertices are distinct. The total vertex irregularity strength of G , denoted by $tvs(G)$, is the minimum value of the largest label over all such irregular assignments. In this paper, we consider the total vertex irregular labeling of complete bipartite graphs $K_{m,n}$ and prove that

$$tvs(K_{m,n}) \geq \max \left\{ \left\lceil \frac{m+n}{m+1} \right\rceil, \left\lceil \frac{2m+n-1}{n} \right\rceil \right\} \text{ if } (m,n) \neq (2,2).$$

1 Introduction

In this paper all graph are finite, simple, undirected, and connected. The graph G has v vertices and e edges. A total vertex irregular labeling on a graph G with v vertices and e edges is an assignment of integer labels to both vertices and edges so that the weights calculated at vertices are distinct. The weight of a vertex v in G is defined as the sum of the label of v and the labels of all the edges incident with v , that is,

$$wt(v) = \lambda(v) + \sum_{uv \in E} \lambda(uv)$$

The notion of a total vertex irregular labeling was introduced by Bača, et al.[1]. The total vertex irregularity strength of G , denoted by $tvs(G)$, is the minimum value of the largest label over all such irregular assignments.