

## Abstract

The total labeling of a graph  $G = (V, E)$  is a bijection from a vertex set and the edge set of  $G$  to the set  $\{1, 2, \dots, n+m\}$ , where  $n = |V(G)|$  and  $m = |E(G)|$ . The edge-weight of an edge under total labeling is the sum of the label of the edge and the labels of the end vertices of that edge. The vertex-weight of a vertex under total labeling is the sum of the label of the vertex and the labels of all the edges incident with that vertex. A total labeling is called edge-magic or vertex-magic when all the edge-weights or vertex-weights are the same, respectively. When all edge-weights or all vertex-weights are different then a total labeling is called edge-antimagic or vertex-antimagic total, respectively.

In this thesis we deal with the problem of finding a total labeling of some classes of graphs that is simultaneously vertex-magic and edge-antimagic or simultaneously edge-magic and vertex-antimagic, respectively. We show several results for stars, paths, cycles, fans, sun graphs, caterpillars and prisms.