CHAPTER 1

INTRODUCTION

All graphs considered in this thesis are finite. The graph G has vertex set V and edge set E and we let $n = |V|$ and $e = |E|$. Throughout the thesis we will assume that $n \geq 2$ and $e \geq 1$.

A one-to-one mapping $\lambda : V \cup E \longrightarrow \{1, 2, ..., n+e\}$ is called a vertex-magic total labeling of G if there is a constant h so that for every vertex x, the weight of x is

$$w_\lambda(x) := \lambda(x) + \sum_{y \in N(x)} \lambda(xy) = h$$

So the magic requirement is the associated weight $w_\lambda(x) = h$ for all vertices x. We called a vertex-magic labeling λ of a graph "super vertex-magic" if $\lambda(V) = \{e+1, e+2, ..., e+n\}$. For a vertex-magic labeling λ of a graph is called "strongly vertex-magic" which $\lambda(V) = \{1, 2, ..., n\}$. The fixed integer h is called the magic number of λ. Vertex-magic total labeling first appeared in 2002 (see[6]).

On 2003 [4], Gray, Macdougall, McSorley, Wallis examined the existence of vertex-magic total labeling of trees and forests. In [7] Swaminathan and Jeyanthi found a conditions of paths and cycles to be super vertex-magic.

On 2006 [1], Balbuena, Barker, Das, Lin, Miller, Ryan, Slamin, Sugeng and Tkac studied on the degrees of strongly vertex-magic graphs.

On 2007 [3], Gomez studied some characteristics which provides a super vertex-magic total labelling of the complete graph K_n.

In this thesis, we are interested in graphs providing of a super vertex-magic total labeling.

This thesis is divided into 4 chapters. Chapter 1 is an introduction to the research problem. Chapter 2 deals with some preliminaries and give some useful results that will be used in later chapters. Chapter 3 is the main results of this research. The conclusion of research is in Chapter 4.