

Chapter 6. Labeling Graphs

Study Guide

The following is a brief list of topics covered in Chapter 6 of Hartsfield and Ringel's *Pearls in Graph Theory: A Comprehensive Introduction* (Academic Press, 1994). This list is not meant to be comprehensive, but only gives a list of several important topics. You should also carefully study the proofs given in class and the homework problems.

Section 6.1. Magic Graphs and Graceful Trees.

Magic graph, magic square, $K_{n,n}$ is magic for $n \neq 2$ (Theorem 6.1.1), bipartite graphs decomposable into two Hamilton cycles are magic (Theorem 6.1.2), graphs decomposable into two magic spanning subgraphs (where one is regular) is magic (Theorem 6.1.3), antimagic graph, conjectures about antimagic graphs (Conjectures 6.1.A and 6.1.B), graceful tree, the Graceful Tree Conjecture, the "turning trick" and cyclic permutations, consecutive labeling of a tree, if a tree is graceful then it is consecutive (Theorem 6.1.5).

Section 6.2. Conservative Graphs.

Directed graph (digraph), arc, tail, head, orientation of edges, conservative graph, Kirchhoff's Current Law, directed sum, graphs decomposable into two Hamilton cycles are conservative (Theorem 6.2.1), Kirchhoff's Global Current Law (Theorem 6.2.2), strongly conservative, using a decomposition into conservative and strongly conservative subgraphs to show that a graph is conservative (Theorem 6.2.3), graphs decomposable into two Hamilton cycles is strongly conservative (Theorem 6.2.1*), graphs decomposable into three Hamilton cycles which are strongly conservative (Theorem 6.2.4), K_n is conservative for $n \geq 4$ (Theorems 6.2.5 and 6.2.7), W_n is conservative for $n \geq 3$ (Theorem 6.2.6).

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