

Chapter 5. Nonseparable Graphs

Study Guide

The following is a brief list of topics covered in Chapter 5 of Bondy and Murty's *Graph Theory*, Graduate Texts in Mathematics 244 (Springer, 2008). 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 5.1. Cut Vertices.

Cut vertex, internally disjoint paths in a graph, classification of connected graphs that do not have cut vertices (Theorem 5.1).

Section 5.2. Separations and Blocks.

Separation, separating vertex, separating vertices of a disconnected graph, cut vertex of a graph is a separating vertex (Note 5.2.A), in a loopless graph the cut vertices and separating vertices are identical (Note 5.2.A), separable/nonseparable graph, a loopless graph is nonseparable if and only its underlying simple graph is nonseparable (Note 5.2.B), classification of connected nonseparable graphs (Theorem 5.2), block of a graph, properties of blocks (Proposition 5.3), block tree, end blocks, internal vertex of a block, splitting off edges, The Splitting Lemma (Theorem 5.4), reduction of the Cycle Double Cover Conjecture to nonseparable cubic graphs (Theorem 5.5).

Section 5.3. Ear Decompositions.

Ear of a graph, some ears of a graph (Proposition 5.6), nested sequence of graphs, ear decomposition of a nonseparable graph, nonseparable graphs (other than K_1 and K_2) have an ear decomposition (Theorem 5.8), classification of strongly connected digraphs (Proposition 5.9), graphs with strong orientations (Theorem 5.10).

Section 5.4. Directed Ear Decompositions.

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