

<<组合网络理论>>

图书基本信息

书名：<<组合网络理论>>

13位ISBN编号：9787030364784

10位ISBN编号：7030364783

出版时间：2013-3

出版时间：科学出版社

作者：徐俊明

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

<<组合网络理论>>

内容概要

《组合网络理论(英文版)》内容简介：This book provides the most basic combinatorial problems and well-established theory in design and analysis of the topological structure of interconnection networks in the graph-theoretic language. It covers the basic methods of network design, several well-known networks such as hypercubes, de Bruijn digraphs, Kautz digraphs, double loop, and the newest parameters to measure performance of networks such as forwarding indices of a routing, Menger number, Rabin number, fault-tolerant diameter, wide-diameter, generalized dominating number, and restricted connectivity. It will be of significant interest to researchers and practitioners working in design and analysis of networks, particularly to undergraduates and postgraduates specializing in computer science and applied mathematics.

Xu Junming is a Professor at School of Mathematical Sciences, the University of Science and Technology of China (USTC), a fellow of Operations Research Society of China, and Commission on Combinatorics and Graph Theory in China. His research interest is combinatorics and graph theory, in particular, combinatorial problems of interconnection networks, has published more than 200 research papers.

书籍目录

Preface
Part Networks and Graphs
Chapter 1 Fundamentals of Networks and Graphs
1.1 Graphs and Networks
1.2 Basic Concepts and Notations
1.3 Trees and Planar Graphs
1.4 Transmission Delay and Diameter
1.5 Fault Tolerance and Connectivity
1.6 Embedding and Routings
1.7 Basic Principles of Network Design
Exercises
Chapter 2 Symmetry of Graphs or Networks
2.1 Fundamentals on Groups
2.2 Vertex-Transitive Graphs
2.3 Edge-Transitive Graphs
2.4 Atoms of Graphs
2.5 Connectivity of Transitive Graphs
Exercises
Part Basic Methods of Network Designs
Chapter 3 Line Graphical Methods
3.1 Line Graphs and Basic Properties
3.2 Basic Properties of Line Digraphs
3.3 Iterated Line Graphs
3.4 Connectivity of Line Graphs
Exercises
Chapter 4 Cayley Methods
4.1 Cayley Graphs
4.2 Transitivity of Cayley Graphs
4.3 Atoms and Connectivity of Cayley Graphs
4.4 Vertex-Transitive Graphs with Prime Order
Exercises
Chapter 5 Cartesian Product Methods
5.1 Cartesian Product of Graphs
5.2 Diameter and Connectivity
5.3 Other Properties of Cartesian Products
5.4 Generalized Cartesian Products
Exercises
Chapter 6 Basic Problems in Optimal Designs
6.1 Undirected (d, k) -Graph Problems
6.2 Directed (d, k) -Graph Problems
6.3 Relations between Diameter and Connectivity
Exercises
Part Well-Known Topologies of Networks
Chapter 7 Hypercube Networks
7.1 Definitions and Basic Properties
7.2 Gray Codes and Cycles
7.3 Lengths of Paths
7.4 Embedding Problems
7.5 Generalized Hypercubes
7.6 Some Variations of Hypercubes
Exercises
Chapter 8 De Bruijn Networks
8.1 Definitions and Basic Properties
8.2 Uniqueness of Shortest Paths
8.3 Generalized de Bruijn Digraphs
8.4 Comparison with Hypercubes
Exercises
Chapter 9 Kautz Networks
9.1 Definitions and Basic Properties
9.2 Generalized Kautz Digraphs
9.3 Connectivity of Generalized Kautz Digraphs
Exercises
Chapter 10 Double Loop Networks
10.1 Double Loop Networks
10.2 L-Tiles in the Plane
10.3 L-Tiles and Double Loop Networks
10.4 Design of Optimal Double Loop Networks
10.5 Basic Properties of Circulant Networks
Exercises
Chapter 11 Topologies of Other Networks
11.1 Mesh Networks and Grid Networks
11.2 Pyramid Networks
11.3 Cube-Connected Cycles
11.4 Butterfly Networks
11.5 Bene* Networks
11.6 Networks
11.7 Shuffle-Exchange Networks
Exercises
Part Fault-Tolerant Analysis of Networks
Chapter 12 Routings in Networks
12.1 Forwarding Index of Routing
12.2 Edge-Forwarding Index of Routing
12.3 Forwarding Indices of Some Graphs
12.4 Delay of Fault-Tolerant Routing
Exercises
Chapter 13 Fault-Tolerant Diameters in Networks
13.1 Diameters of Altered Graphs
13.2 Edge Fault-Tolerant Diameters
13.3 Relations between Two Diameters
13.4 Vertex Fault-Tolerant Diameters
13.5 Fault-Tolerant Diameter of Product Graphs
13.6 Fault-Tolerant Diameters of Some Networks
Exercises
Chapter 14 Menger-Type Problems in Parallel Systems
14.1 Menger-Type Problems
14.2 Bounded Menger Number and Connectivity
14.3 Bounded Edge-Connectivity
14.4 Rabin Numbers of Networks
Exercises
Chapter 15 Wide-Diameters of Networks
15.1 Wide-Diameter and Basic Results
15.2 Wide-Diameter of Regular Graphs
15.3 Wide-Diameter of Cartesian Products
15.4 Wide-Diameter and Independence Number
15.5 Wide-Diameter and Fault-Tolerant Diameter
15.6 Wide-Diameters of Some Networks
Exercises
Chapter 16 Generalized Independence and Domination Numbers
16.1 Generalized Independence Numbers
16.2 Generalized Domination Numbers
16.3 Distance Independence and Domination
Exercises
Chapter 17 Restricted Fault-Tolerance of Networks
17.1 Restricted Connectivity and Diameter
17.2 Restricted Edge-Connectivity
17.3 Restricted Edge-Atoms
17.4 Results on Transitive Graphs
17.5 Super Connectivity of Networks
17.6 Super Edge-Connectivity of Networks
17.7 Super Connectivity of Line Graphs
17.8 Connectivity Restricted by Degree-Conditions
17.9 Connectivity Restricted by Order-Conditions
17.10 Restricted Connectivity of Some Networks
Exercises
Bibliography
A List of Notations
Index

章节摘录

Chapter 1 Fundamentals of Networks and Graphs In this chapter, we will briefly recall some basic concepts and notations on graph theory used in this book as well as the corresponding backgrounds in networks. Some basic results on graph theory will be stated, but some proofs will be omitted. For a comprehensive treatment of the graph-theoretic concepts and results discussed herein, the reader is referred to any standard text-book on graph theory, for example, Bondy and Murty [59], Chartrand and Lesniak [83], or Xu [503].

1.1 Graphs and Networks

In this section, we will introduce some concepts on graphs as well as how to model an interconnection network by a graph. Although they have been contained in any standard text-book on graph theory, these concepts defined by one author are different from ones by another. In order to avoid quibbling it is necessary to present a formidable number of definitions. A graph G is an ordered pair (V, E) , where both V and E are non-empty sets, $V = V(G)$ is the vertex-set of G , elements in which are called vertices of G ; $E = E(G) \subseteq V \times V$ is the edge-set of G , elements in which are called edges of G . The number of vertices of G , also called order of G , is denoted by $|V(G)|$. The number of edges of G , also called size of G , is denoted by $|E(G)|$. Two vertices corresponding an edge are called the end-vertices of the edge. The edge whose end-vertices are identical is a loop. The end-vertices of an edge are said to be incident with the edge, and vice versa. Two vertices are said to be adjacent if they are two end-vertices of some edge; two edges are said to be adjacent if they have an end-vertex in common. If $E \subseteq V \times V$ is considered as a set of ordered pairs, then the graph $G = (V, E)$ is called a directed graph, or digraph for short. For an edge e of a digraph G , sometimes, called a directed edge or arc, if $e = (x, y) \in E(G)$, then vertices x and y are called the tail and the head of e , respectively; and e is called an out-going edge of x and an in-coming edge of y . If $E \subseteq V \times V$ is considered as a set of unordered pairs, then the graph $G = (V, E)$ is called an undirected graph. Note that an undirected graph does not admit loops. Usually, it is convenient to denote an unordered pair of vertices by xy or yx instead of $\{x, y\}$. Edges of an undirected graph are sometimes called undirected edges. A graph G is empty if $|E(G)| = 0$, denoted by K_c , and non-empty otherwise. An undirected graph can be thought of as a particular digraph, a symmetric digraph, in which there are two directed edges called symmetric edges, one in each direction, corresponding to each undirected edge. Thus, to study structural properties of graphs for digraphs is more general than for undirected graphs. A digraph is said to be non-symmetric if it contains no symmetric edges.

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>