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THEORY AND PROBLEMS OF COMBINATORICS

New Age International **Combinatorics Is The Mathematics Of Counting, Selecting And Arranging Objects. Combinatorics Include The Theory Of Permutations And Combinations. These Topics Have An Enormous Range Of Applications In Pure And Applied Mathematics And Computer Science. These Are Processes By Which We Organize Sets So That We Can Interpret And Apply The Data They Contain. Generally Speaking, Combinatorial Questions Ask Whether A Subset Of A Given Set Can Be Chosen And Arranged In A Way That Conforms With Certain Constraints And, If So, In How Many Ways It Can Be Done. Applications Of Combinatorics Play A Major Role In The Analysis Of Algorithms.For Example, It Is Often Necessary In Such Analysis To Count The Average Number Of Times That A Particular Portion Of An Algorithm Is Executed Over All Possible Data Sets. This Topic Also Includes Solution Of Difference Equations. Differences Are Required For Analysis Of Algorithmic Complexity, And Since Computers Are Frequently Used In The Numerical Solution Of Differential Equations Via Their Discretized Versions Which Are Difference Equations. It Also Deals With Questions About Configurations Of Sets, Families Of Finite Sets That Overlap According To Some Prescribed Numerical Or Geometrical Conditions. Skill In Using Combinatorial Techniques Is Needed In Almost Every Discipline Where Mathematics Is Applied.Salient Features * Over 1000 Problems Are Used To Illustrate Concepts, Related To Different Topics, And Introduce Applications. * Over 1000 Exercises In The Text With Many Different Types Of Questions Posed. * Precise Mathematical Language Is Used Without Excessive Formalism And Abstraction. * Precise Mathematical Language Is Used Without Excessive Formalism And Abstraction. * Problem Sets Are Started Clearly And Unambiguously And All Are Carefully Graded For Various Levels Of Difficulty.**

MATHEMATICAL REVIEWS

GRAPH THEORY WITH APPLICATIONS

New Age International **Salient Features * Over 1500 Problems Are Used To Illustrate Concepts, Related To Different Topics, And Introduce Applications. * Over 1000 Exercises In The Text With Many Different Types Of Questions Posed. * Precise Mathematical Language Is Used Without Excessive Formalism And Abstraction. * Care Has Been Taken To Balance The Mix Of Notation And Words In Mathematical Statements. * Problem Sets Are Stated Clearly And Unambiguously, And All Are Carefully Graded For Various Levels Of Difficulty. * This Text Has Been Carefully Designed For Flexible Use.**

COMBINATORICS AND GRAPH THEORY (AS PER U.P.T.U. SYLLABUS)

About the Book: This text has been carefully designed for flexible use for First Semester M.C.A. course of Uttar Pradesh Technical University (U.P.T.U.), and it contains the following features: Precise mathematical language is used without excessive formalism and abstraction. Over 900 exercises (problem sets) in the text with many different types of questions posed. Care has been taken to balance the mix of notation and words in mathematical statements. Problem sets (exercises) are stated clearly and unambiguously and all are carefully graded for various levels of difficulty. Contents.

A WALK THROUGH COMBINATORICS

AN INTRODUCTION TO ENUMERATION AND GRAPH THEORY FOURTH EDITION

World Scientific Publishing Company **This is a textbook for an introductory combinatorics course lasting one or two semesters. An extensive list of problems, ranging from routine exercises to research questions, is included. In each section, there are also exercises that contain material not explicitly discussed in the preceding text, so as to provide instructors with extra choices if they want to shift the emphasis of their course. Just as with the first three editions, the new edition walks the reader through the classic parts of combinatorial enumeration and graph theory, while also discussing some recent progress in the area: on the one hand, providing material that will help students learn the basic techniques, and on the other hand, showing that some questions at the forefront of research are comprehensible and accessible to the talented and hardworking undergraduate. The basic topics discussed are: the twelvefold way, cycles in permutations, the formula of inclusion and exclusion, the notion of graphs and trees, matchings, Eulerian and**

Hamiltonian cycles, and planar graphs. New to this edition are the Quick Check exercises at the end of each section. In all, the new edition contains about 240 new exercises. Extra examples were added to some sections where readers asked for them. The selected advanced topics are: Ramsey theory, pattern avoidance, the probabilistic method, partially ordered sets, the theory of designs, enumeration under group action, generating functions of labeled and unlabeled structures and algorithms and complexity. The book encourages students to learn more combinatorics, provides them with a not only useful but also enjoyable and engaging reading. The Solution Manual is available upon request for all instructors who adopt this book as a course text. Please send your request to sales@wspc.com. The previous edition of this textbook has been adopted at various schools including UCLA, MIT, University of Michigan, and Swarthmore College. It was also translated into Korean.

ABSTRACTS OF PAPERS PRESENTED TO THE AMERICAN MATHEMATICAL SOCIETY

GRAPH THEORY WITH APPLICATIONS TO ENGINEERING AND COMPUTER SCIENCE

PHI Learning Pvt. Ltd. **Because of its inherent simplicity, graph theory has a wide range of applications in engineering, and in physical sciences. It has of course uses in social sciences, in linguistics and in numerous other areas. In fact, a graph can be used to represent almost any physical situation involving discrete objects and the relationship among them. Now with the solutions to engineering and other problems becoming so complex leading to larger graphs, it is virtually difficult to analyze without the use of computers. This book is recommended in IIT Kharagpur, West Bengal for B.Tech Computer Science, NIT Arunachal Pradesh, NIT Nagaland, NIT Agartala, NIT Silchar, Gauhati University, Dibrugarh University, North Eastern Regional Institute of Management, Assam Engineering College, West Bengal Univerity of Technology (WBUT) for B.Tech, M.Tech Computer Science, University of Burdwan, West Bengal for B.Tech. Computer Science, Jadavpur University, West Bengal for M.Sc. Computer Science, Kalyani College of Engineering, West Bengal for B.Tech. Computer Science. Key Features: This book provides a rigorous yet informal treatment of graph theory with an emphasis on computational aspects of graph theory and graph-theoretic algorithms. Numerous applications to actual engineering problems are incorpo-rated with software design and optimization topics.**

COMPLEX ANALYSIS

Princeton University Press **With this second volume, we enter the intriguing world of complex analysis. From the first theorems on, the elegance and sweep of the results is evident. The starting point is the simple idea of extending a function initially given for real values of the argument to one that is defined when the argument is complex. From there, one proceeds to the main properties of holomorphic functions, whose proofs are generally short and quite illuminating: the Cauchy theorems, residues, analytic continuation, the argument principle. With this background, the reader is ready to learn a wealth of additional material connecting the subject with other areas of mathematics: the Fourier transform treated by contour integration, the zeta function and the prime number theorem, and an introduction to elliptic functions culminating in their application to combinatorics and number theory. Thoroughly developing a subject with many ramifications, while striking a careful balance between conceptual insights and the technical underpinnings of rigorous analysis, Complex Analysis will be welcomed by students of mathematics, physics, engineering and other sciences. The Princeton Lectures in Analysis represents a sustained effort to introduce the core areas of mathematical analysis while also illustrating the organic unity between them. Numerous examples and applications throughout its four planned volumes, of which Complex Analysis is the second, highlight the far-reaching consequences of certain ideas in analysis to other fields of mathematics and a variety of sciences. Stein and Shakarchi move from an introduction addressing Fourier series and integrals to in-depth considerations of complex analysis; measure and integration theory, and Hilbert spaces; and, finally, further topics such as functional analysis, distributions and elements of probability theory.**

NOTES ON INTRODUCTORY COMBINATORICS

Springer Science & Business Media **In the winter of 1978, Professor George P61ya and I jointly taught Stanford University's introductory combinatorics course. This was a great opportunity for me, as I had known of Professor P61ya since having read his classic book, How to Solve It, as a teenager. Working with P6lya, who ·was over ninety years old at the time, was every bit as rewarding as I had hoped it would be. His creativity, intelligence, warmth and generosity of spirit, and wonderful gift for teaching continue to be an inspiration to me. Combinatorics is one of the branches of mathematics that play a crucial role in computer sCience, since digital computers manipulate discrete, finite objects. Combinatorics impinges on computing in two ways. First, the properties of graphs and other combinatorial objects lead directly to algorithms for solving graph-theoretic problems, which have widespread application in non-numerical as well as in numerical computing. Second, combinatorial methods provide many analytical tools that can be used for determining the worst-case and expected performance of computer algorithms. A knowledge of combinatorics will serve the computer scientist well. Combinatorics can be classified into three types: enumerative, eXistential, and constructive. Enumerative combinatorics deals with the counting of combinatorial objects. Existential combinatorics studies the existence or nonexistence of combinatorial configurations.**

GRAPH THEORY WITH APPLICATIONS

London : Macmillan Press

INDEX OF MATHEMATICAL PAPERS

INTRODUCTION TO PROPERTY TESTING

Cambridge University Press **An extensive and authoritative introduction to property testing, the study of super-fast algorithms for the structural analysis of large quantities of data in order to determine global properties. This book can be used both as a reference book and a textbook, and includes numerous exercises.**

A FIRST COURSE IN GRAPH THEORY

Courier Corporation **Written by two prominent figures in the field, this comprehensive text provides a remarkably student-friendly approach. Its sound yet accessible treatment emphasizes the history of graph theory and offers unique examples and lucid proofs. 2004 edition.**

TWELFTH ACM SYMPOSIUM ON OPERATING SYSTEMS PRINCIPLES, DECEMBER 1989

Assn for Computing Machinery

HIGH PERFORMANCE MASS STORAGE AND PARALLEL I/O

TECHNOLOGIES AND APPLICATIONS

Wiley-IEEE Press **Due to the growth of Internet-driven applications, issues such as storage capacity and access speed have become critical in the design of today's computer systems Book fills the need for a readily-accessible single reference source on the subject of high-performance, large scale storage and delivery systems Contains the latest information and future directions of disk arrays and parallel I/O A Wiley-IEEE Press Publication**

PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY

Contains the material formerly published in even-numbered issues of the Bulletin of the American Mathematical Society.

PRINCIPLES AND TECHNIQUES IN COMBINATORICS

World Scientific **A textbook suitable for undergraduate courses. The materials are presented very explicitly so that students will find it very easy to read. A wide range of examples, about 500 combinatorial problems taken from various mathematical competitions and exercises are also included.**

NOTICES OF THE AMERICAN MATHEMATICAL SOCIETY

INTRODUCTION TO GRAPH THEORY

Prentice Hall **Originally published in 2001, reissued as part of Pearson's modern classic series.**

PROBLEM-SOLVING METHODS IN COMBINATORICS

AN APPROACH TO OLYMPIAD PROBLEMS

Springer Science & Business Media **Every year there is at least one combinatorics problem in each of the major international mathematical olympiads. These problems can only be solved with a very high level of wit and creativity. This book explains all the problem-solving techniques necessary to tackle these problems, with clear examples from recent contests. It also includes a large problem section for each topic, including hints and full solutions so that the reader can practice the material covered in the book. The material will be useful not only to participants in the olympiads and their coaches but also in university courses on combinatorics.**

A UNIFIED APPROACH TO INTERIOR POINT ALGORITHMS FOR LINEAR COMPLEMENTARITY PROBLEMS

Springer Science & Business Media **Following Karmarkar's 1984 linear programming algorithm, numerous interior-point algorithms have been proposed for various mathematical programming problems such as linear programming, convex quadratic programming and convex programming in general. This monograph presents a study of interior-point algorithms for the linear complementarity problem (LCP) which is known as a mathematical model for primal-dual pairs of linear programs and convex quadratic programs. A large family of potential reduction algorithms is presented in a unified way for the class of LCPs where the underlying matrix has nonnegative principal minors (P0-matrix). This class includes various important subclasses such as positive semi-definite matrices, P-matrices, P*-matrices introduced in this monograph, and column sufficient matrices. The family contains not only the usual potential reduction algorithms but also path following algorithms and a damped Newton method for the LCP. The main topics are global convergence, global linear convergence, and the polynomial-time convergence of potential reduction algorithms included in the family.**

GRAPHICAL ENUMERATION

Elsevier **Graphical Enumeration deals with the enumeration of various kinds of graphs. Topics covered range from labeled enumeration and George Pólya's theorem to rooted and unrooted trees, graphs and digraphs, and power group**

enumeration. Superposition, blocks, and asymptotics are also discussed. A number of unsolved enumeration problems are presented. Comprised of 10 chapters, this book begins with an overview of labeled graphs, followed by a description of the basic enumeration theorem of Pólya. The next three chapters count an enormous variety of trees, graphs, and digraphs. The Power Group Enumeration Theorem is then described together with some of its applications, including the enumeration of self-complementary graphs and digraphs and finite automata. Two other chapters focus on the counting of superposition and blocks, while another chapter is devoted to asymptotic numbers that are developed for several different graphical structures. The book concludes with a comprehensive definitive list of unsolved graphical enumeration problems. This monograph will be of interest to both students and practitioners of mathematics.

MODERN GRAPH THEORY

Springer Science & Business Media **An in-depth account of graph theory, written for serious students of mathematics and computer science. It reflects the current state of the subject and emphasises connections with other branches of pure mathematics. Recognising that graph theory is one of several courses competing for the attention of a student, the book contains extensive descriptive passages designed to convey the flavour of the subject and to arouse interest. In addition to a modern treatment of the classical areas of graph theory, the book presents a detailed account of newer topics, including Szemerédis Regularity Lemma and its use, Shelahs extension of the Hales-Jewett Theorem, the precise nature of the phase transition in a random graph process, the connection between electrical networks and random walks on graphs, and the Tutte polynomial and its cousins in knot theory. Moreover, the book contains over 600 well thought-out exercises: although some are straightforward, most are substantial, and some will stretch even the most able reader.**

HOW TO COUNT

AN INTRODUCTION TO COMBINATORICS AND ITS APPLICATIONS

Springer **Providing a self-contained resource for upper undergraduate courses in combinatorics, this text emphasizes computation, problem solving, and proof technique. In particular, the book places special emphasis the Principle of Inclusion and Exclusion and the Multiplication Principle. To this end, exercise sets are included at the end of every section, ranging from simple computations (evaluate a formula for a given set of values) to more advanced proofs. The exercises are designed to test students' understanding of new material, while reinforcing a working mastery of the key concepts previously developed in the book. Intuitive descriptions for many abstract techniques are included. Students often struggle with certain topics, such as generating functions, and this intuitive approach to the problem is helpful in their understanding. When possible, the book introduces concepts using combinatorial methods (as opposed to induction or algebra) to prove identities. Students are also asked to prove identities using combinatorial methods as part of their exercises. These methods have several advantages over induction or algebra.**

SCHAUM'S OUTLINE OF GRAPH THEORY: INCLUDING HUNDREDS OF SOLVED PROBLEMS

McGraw Hill Professional **Student's love Schaum's--and this new guide will show you why! Graph Theory takes you straight to the heart of graphs. As you study along at your own pace, this study guide shows you step by step how to solve the kind of problems you're going to find on your exams. It gives you hundreds of completely worked problems with full solutions. Hundreds of additional problems let you test your skills, then check the ansers. So if you want to get a firm handle on graph theory--whether to ace your graph course, to supplement a course that uses graphs, or to build a solid basis for future study--there's no better tool than Schaum's. This guide makes a wonderful supplement to your class text, but it is so comprehensive that it can even be used alone as a complete graph theory independent study course!**

CRYPTOGRAPHY

Springer **This text introduces cryptography, from its earliest roots to cryptosystems used today for secure online communication. Beginning with classical ciphers and their cryptanalysis, this book proceeds to focus on modern public key cryptosystems such as Diffie-Hellman, ElGamal, RSA, and elliptic curve cryptography with an analysis of vulnerabilities of these systems and underlying mathematical issues such as factorization algorithms. Specialized topics such as zero knowledge proofs, cryptographic voting, coding theory, and new research are covered in the final section of this book. Aimed at undergraduate students, this book contains a large selection of problems, ranging from straightforward to difficult, and can be used as a textbook for classes as well as self-study. Requiring only a solid grounding in basic mathematics, this book will also appeal to advanced high school students and amateur mathematicians interested in this fascinating and topical subject.**

DISCRETE MATHEMATICS WITH GRAPH THEORY (CLASSIC VERSION)

Pearson **Originally published in 2006, reissued as part of Pearson's modern classic series.**

DIFFERENTIAL GEOMETRY OF CURVES AND SURFACES

Springer Nature **This book is a posthumous publication of a classic by Prof. Shoshichi Kobayashi, who taught at U.C. Berkeley for 50 years, recently translated by Eriko Shinozaki Nagumo and Makiko Sumi Tanaka. There are five chapters: 1. Plane Curves and Space Curves; 2. Local Theory of Surfaces in Space; 3. Geometry of Surfaces; 4. Gauss-Bonnet Theorem; and 5. Minimal Surfaces. Chapter 1 discusses local and global properties of planar curves and**

curves in space. Chapter 2 deals with local properties of surfaces in 3-dimensional Euclidean space. Two types of curvatures — the Gaussian curvature K and the mean curvature H —are introduced. The method of the moving frames, a standard technique in differential geometry, is introduced in the context of a surface in 3-dimensional Euclidean space. In Chapter 3, the Riemannian metric on a surface is introduced and properties determined only by the first fundamental form are discussed. The concept of a geodesic introduced in Chapter 2 is extensively discussed, and several examples of geodesics are presented with illustrations. Chapter 4 starts with a simple and elegant proof of Stokes' theorem for a domain. Then the Gauss–Bonnet theorem, the major topic of this book, is discussed at great length. The theorem is a most beautiful and deep result in differential geometry. It yields a relation between the integral of the Gaussian curvature over a given oriented closed surface S and the topology of S in terms of its Euler number $\chi(S)$. Here again, many illustrations are provided to facilitate the reader's understanding. Chapter 5, Minimal Surfaces, requires some elementary knowledge of complex analysis. However, the author retained the introductory nature of this book and focused on detailed explanations of the examples of minimal surfaces given in Chapter 2.

DIFFERENTIAL EQUATIONS

Cengage Learning **Incorporating an innovative modeling approach, this book for a one-semester differential equations course emphasizes conceptual understanding to help users relate information taught in the classroom to real-world experiences. Certain models reappear throughout the book as running themes to synthesize different concepts from multiple angles, and a dynamical systems focus emphasizes predicting the long-term behavior of these recurring models. Users will discover how to identify and harness the mathematics they will use in their careers, and apply it effectively outside the classroom. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.**

STUDIES IN THE HISTORY OF INDIAN MATHEMATICS

Springer **This volume is the outcome of a seminar on the history of mathematics held at the Chennai Mathematical Institute during January-February 2008 and contains articles based on the talks of distinguished scholars both from the West and from India. The topics covered include: (1) geometry in the oulvasatras; (2) the origins of zero (which can be traced to ideas of lopa in Paoini's grammar); (3) combinatorial methods in Indian music (which were developed in the context of prosody and subsequently applied to the study of tonal and rhythmic patterns in music); (4) a cross-cultural view of the development of negative numbers (from Brahmagupta (c. 628 CE) to John Wallis (1685 CE); (5) Kunnaka, Bhavana and Cakravala (the techniques developed by Indian mathematicians for the solution of indeterminate equations); (6) the development of calculus in India (covering the millennium-long history of discoveries culminating in the work of the Kerala school giving a complete analysis of the basic calculus of polynomial and trigonometrical functions); (7) recursive methods in Indian mathematics (going back to Paoini's grammar and culminating in the recursive proofs found in the Malayalam text Yuktibhaua (1530 CE)); and (8) planetary and lunar models developed by the Kerala School of Astronomy. The articles in this volume cover a substantial portion of the history of Indian mathematics and astronomy. This book will serve the dual purpose of bringing to the international community a better perspective of the mathematical heritage of India and conveying the message that much work remains to be done, namely the study of many unexplored manuscripts still available in libraries in India and abroad.**

FUNDAMENTAL MATHEMATICAL ANALYSIS

Springer Nature **This textbook offers a comprehensive undergraduate course in real analysis in one variable. Taking the view that analysis can only be properly appreciated as a rigorous theory, the book recognises the difficulties that students experience when encountering this theory for the first time, carefully addressing them throughout. Historically, it was the precise description of real numbers and the correct definition of limit that placed analysis on a solid foundation. The book therefore begins with these crucial ideas and the fundamental notion of sequence. Infinite series are then introduced, followed by the key concept of continuity. These lay the groundwork for differential and integral calculus, which are carefully covered in the following chapters. Pointers for further study are included throughout the book, and for the more adventurous there is a selection of "nuggets", exciting topics not commonly discussed at this level. Examples of nuggets include Newton's method, the irrationality of π, Bernoulli numbers, and the Gamma function. Based on decades of teaching experience, this book is written with the undergraduate student in mind. A large number of exercises, many with hints, provide the practice necessary for learning, while the included "nuggets" provide opportunities to deepen understanding and broaden horizons.**

GRAPHS & DIGRAPHS, FIFTH EDITION

CRC Press **Continuing to provide a carefully written, thorough introduction, Graphs & Digraphs, Fifth Edition expertly describes the concepts, theorems, history, and applications of graph theory. Nearly 50 percent longer than its bestselling predecessor, this edition reorganizes the material and presents many new topics. New to the Fifth Edition New or expanded coverage of graph minors, perfect graphs, chromatic polynomials, nowhere-zero flows, flows in networks, degree sequences, toughness, list colorings, and list edge colorings New examples, figures, and applications to illustrate concepts and theorems Expanded historical discussions of well-known mathematicians and problems More than 300 new exercises, along with hints and solutions to odd-numbered exercises at the back of the book Reorganization of sections into subsections to make the material easier to read Bolded definitions of terms, making them easier to locate Despite a field that has evolved over the years, this student-friendly, classroom-tested text remains the consummate introduction to graph theory. It explores the subject's fascinating history and presents a host**

of interesting problems and diverse applications.

THE BOOKSELLER

SCHAUM'S OUTLINE OF COMBINATORICS

McGraw Hill Professional **Confusing Textbooks? Missed Lectures? Tough Test Questions? Fortunately for you, there's Schaum's Outlines. More than 40 million students have trusted Schaum's to help them succeed in the classroom and on exams. Schaum's is the key to faster learning and higher grades in every subject. Each Outline presents all the essential course information in an easy-to-follow, topic-by-topic format. You also get hundreds of examples, solved problems, and practice exercises to test your skills. This Schaum's Outline gives you Practice problems with full explanations that reinforce knowledge Coverage of the most up-to-date developments in your course field In-depth review of practices and applications Fully compatible with your classroom text, Schaum's highlights all the important facts you need to know. Use Schaum's to shorten your study time-and get your best test scores! Schaum's Outlines-Problem Solved.**

ADVANCED ENGINEERING MATHEMATICS WITH MODELING APPLICATIONS

CRC Press **Engineers require a solid knowledge of the relationship between engineering applications and underlying mathematical theory. However, most books do not present sufficient theory, or they do not fully explain its importance and relevance in understanding those applications. Advanced Engineering Mathematics with Modeling Applications employs a balanced approach to address this informational void, providing a solid comprehension of mathematical theory that will enhance understanding of applications – and vice versa. With a focus on modeling, this book illustrates why mathematical methods work, when they apply, and what their limitations are. Designed specifically for use in graduate-level courses, this book: Emphasizes mathematical modeling, dimensional analysis, scaling, and their application to macroscale and nanoscale problems Explores eigenvalue problems for discrete and continuous systems and many applications Develops and applies approximate methods, such as Rayleigh-Ritz and finite element methods Presents applications that use contemporary research in areas such as nanotechnology Apply the Same Theory to Vastly Different Physical Problems Presenting mathematical theory at an understandable level, this text explores topics from real and functional analysis, such as vector spaces, inner products, norms, and linear operators, to formulate mathematical models of engineering problems for both discrete and continuous systems. The author presents theorems and proofs, but without the full detail found in mathematical books, so that development of the theory does not obscure its application to engineering problems. He applies principles and theorems of linear algebra to derive solutions, including proofs of theorems when they are instructive. Tying mathematical theory to applications, this book provides engineering students with a strong foundation in mathematical terminology and methods.**

LINEAR PROGRAMMING AND NETWORK FLOWS

John Wiley & Sons Incorporated **Table of contents**

A PATH TO COMBINATORICS FOR UNDERGRADUATES

COUNTING STRATEGIES

Springer Science & Business Media **This unique approach to combinatorics is centered around unconventional, essay-type combinatorial examples, followed by a number of carefully selected, challenging problems and extensive discussions of their solutions. Topics encompass permutations and combinations, binomial coefficients and their applications, bijections, inclusions and exclusions, and generating functions. Each chapter features fully-worked problems, including many from Olympiads and other competitions, as well as a number of problems original to the authors; at the end of each chapter are further exercises to reinforce understanding, encourage creativity, and build a repertory of problem-solving techniques. The authors' previous text, "102 Combinatorial Problems," makes a fine companion volume to the present work, which is ideal for Olympiad participants and coaches, advanced high school students, undergraduates, and college instructors. The book's unusual problems and examples will interest seasoned mathematicians as well. "A Path to Combinatorics for Undergraduates" is a lively introduction not only to combinatorics, but to mathematical ingenuity, rigor, and the joy of solving puzzles.**

PROBABILITY AND COMPUTING

RANDOMIZED ALGORITHMS AND PROBABILISTIC ANALYSIS

Cambridge University Press **"This textbook is designed to accompany a one- or two-semester course for advanced undergraduates or beginning graduate students in computer science and applied mathematics. - It gives an excellent introduction to the probabilistic techniques and paradigms used in the development of probabilistic algorithms and analyses. - It assumes only an elementary background in discrete mathematics and gives a rigorous yet accessible treatment of the material, with numerous examples and applications."--Jacket.**

HANDBOOK OF DESIGN AND ANALYSIS OF EXPERIMENTS

CRC Press **Handbook of Design and Analysis of Experiments provides a detailed overview of the tools required for the optimal design of experiments and their analyses. The handbook gives a unified treatment of a wide range of topics,**

covering the latest developments. This carefully edited collection of 25 chapters in seven sections synthesizes the state of the art in the theory and applications of designed experiments and their analyses. Written by leading researchers in the field, the chapters offer a balanced blend of methodology and applications. The first section presents a historical look at experimental design and the fundamental theory of parameter estimation in linear models. The second section deals with settings such as response surfaces and block designs in which the response is modeled by a linear model, the third section covers designs with multiple factors (both treatment and blocking factors), and the fourth section presents optimal designs for generalized linear models, other nonlinear models, and spatial models. The fifth section addresses issues involved in designing various computer experiments. The sixth section explores "cross-cutting" issues relevant to all experimental designs, including robustness and algorithms. The final section illustrates the application of experimental design in recently developed areas. This comprehensive handbook equips new researchers with a broad understanding of the field's numerous techniques and applications. The book is also a valuable reference for more experienced research statisticians working in engineering and manufacturing, the basic sciences, and any discipline that depends on controlled experimental investigation.

CONTRIBUTIONS TO THE HISTORY OF INDIAN MATHEMATICS

Springer **This volume consists of a collection of articles based on lectures given by scholars from India, Europe and USA at the sessions on 'History of Indian Mathematics' at the AMS-India mathematics conference in Bangalore during December 2003. These articles cover a wide spectrum of themes in Indian mathematics. They begin with the mathematics of the ancient period dealing with Vedic Prosody and Buddhist Logic, move on to the work of Brahmagupta, of Bhaskara, and that of the mathematicians of the Kerala school of the classical and medieval period, and end with the work of Ramanaujan, and Indian contributions to Quantum Statistics during the modern era. The volume should be of value to those interested in the history of mathematics.**