

Electrical Engineering All Formula

On the basis of instrument electrical and automatic control system, the 5th International Conference on Electrical Engineering and Automatic Control (CEEAC) was established at the crossroads of information technology and control technology, and seeks to effectively apply information technology to a sweeping trend that views control as the core of intelligent manufacturing and life. This book takes a look forward into advanced manufacturing development, an area shaped by intelligent manufacturing. It highlights the application and promotion of process control represented by traditional industries, such as the steel industry and petrochemical industry; the technical equipment and system cooperative control represented by robot technology and multi-axis CNC; and the control and support of emerging process technologies represented by laser melting and stacking, as well as the emerging industry represented by sustainable and intelligent life. The book places particular emphasis on the micro-segments field, such as intelligent micro-grids, new energy vehicles, and the Internet of Things.

A comprehensive revision of the famed pocket guide giving engineers, scientists and other specialists a wide range of technical and mathematical formulas in a handy format. Now including a new section on control engineering, this edition is updated throughout and includes 50 additional pages. This perennial best-seller puts engineering formulas most used on the job at the user's fingertips. Thoroughly practical and authoritative, it brings together in one source thousands of formulas and hundreds of diagrams to simplify all engineering and technical calculations. Comprehensive section cover: Units, Areas, Solid Bodies, Arithmetic, Functions of a Circle, Analytical Geometry, Statistics, Differential Calculus, Integral Calculus, Differential Equations, Statics, Kinematics, Dynamics, Hydraulics, Heat, Strength, Machine Parts, Production Engineering, Electrical Engineering, Control Engineering, Radiation Physics, Chemistry, Tables.

Stormy development of electronic computation techniques (computer systems and software), observed during the last decades, has made possible automation of data processing in many important human activity areas, such as science, technology, economics and labor organization. In a broadly understood technology area, this development led to separation of specialized forms of using computers for the design and manufacturing processes, that is: – computer-aided design (CAD) – computer-aided manufacture (CAM) In order to show the role of computer in the first of the two applications mentioned above, let us consider basic stages of the design process for a standard piece of electronic system, or equipment: – formulation of requirements concerning user properties (characteristics, parameters) of the designed equipment, – elaboration of the initial, possibly general electric structure, – determination of mathematical model of the system on the basis of the adopted electric structure, – determination of basic responses (frequency- or time-domain) of the system, on the basis of previously established mathematical model, – repeated modification of the adopted diagram (changing its structure or element values) in case, when it does not satisfy the adopted requirements, – preparation of design and technological documentation, – manufacturing of model (prototype) series, according to the prepared documentation, – testing the prototype under the aspect of its electric properties,

mechanical durability and sensitivity to environment conditions, – modification of prototype documentation, if necessary, and handing over the documentation to series production. The most important stages of the process under discussion are illustrated in Fig. 1. 1. xi xii Introduction Fig. 1.

The Electrical Engineer's Handbook is an invaluable reference source for all practicing electrical engineers and students. Encompassing 79 chapters, this book is intended to enlighten and refresh knowledge of the practicing engineer or to help educate engineering students. This text will most likely be the engineer's first choice in looking for a solution; extensive, complete references to other sources are provided throughout. No other book has the breadth and depth of coverage available here. This is a must-have for all practitioners and students! The Electrical Engineer's Handbook provides the most up-to-date information in: Circuits and Networks, Electric Power Systems, Electronics, Computer-Aided Design and Optimization, VLSI Systems, Signal Processing, Digital Systems and Computer Engineering, Digital Communication and Communication Networks, Electromagnetics and Control and Systems. About the Editor-in-Chief... Wai-Kai Chen is Professor and Head Emeritus of the Department of Electrical Engineering and Computer Science at the University of Illinois at Chicago. He has extensive experience in education and industry and is very active professionally in the fields of circuits and systems. He was Editor-in-Chief of the IEEE Transactions on Circuits and Systems, Series I and II, President of the IEEE Circuits and Systems Society and is the Founding Editor and Editor-in-Chief of the Journal of Circuits, Systems and Computers. He is the recipient of the Golden Jubilee Medal, the Education Award, and the Meritorious Service Award from the IEEE Circuits and Systems Society, and the Third Millennium Medal from the IEEE. Professor Chen is a fellow of the IEEE and the American Association for the Advancement of Science. * 77 chapters encompass the entire field of electrical engineering. * THOUSANDS of valuable figures, tables, formulas, and definitions. * Extensive bibliographic references.

Smartly conceived and fast paced, his book offers something for anyone curious about math and its impacts. Electrical and Electronics Engineering Formulas shows how concepts evolve out with the help of some equations like the equation for electric current and potential difference. Eventually, formulas are used to provide engineering solution for real-world problems. Formulas can be a theory or principle, an equation, a logical relation with numbers, symbols and variables that signifies the relationship between variables. Simple possession of the individual knowledge and talents assures engineering professionals to design the devices, and processes that comprises of engineering inventions and their practices. An engineer must identify how to relate to the knowledge of solved problems and comprehend the present need to synthesize new solutions. The book contains concepts of electricals and electronics, symbols, parameters, numbers, units or any combination of them for a basic understanding of, this niche subject. The book serves as a compendium of engineering formulas for Electrical and electronics engineers, university students of engineering and employees at electrical and electronics companies in general. Author focuses on Engineering formulas to usher, so they can never be bored of Engineering!

Although it is popularly assumed that the history of computing before the second half of the 20th century was unimportant, in fact

the Industrial Revolution was made possible and even sustained by a parallel revolution in computing technology. An examination and historiographical assessment of key developments helps to show how the era of modern electronic computing proceeded from a continual computing revolution that had arisen during the mechanical and the electrical ages. This unique volume introduces the history of computing during the “first” (steam) and “second” (electricity) segments of the Industrial Revolution, revealing how this history was pivotal to the emergence of electronic computing and what many historians see as signifying a shift to a post-industrial society. It delves into critical developments before the electronic era, focusing on those of the mechanical era (from the emergence of the steam engine to that of the electric power network) and the electrical era (from the emergence of the electric power network to that of electronic computing). In so doing, it provides due attention to the demarcations between—and associated classifications of—artifacts for calculation during these respective eras. In turn, it emphasizes the history of comparisons between these artifacts. Topics and Features: motivates exposition through a firm historiographical argument of important developments explores the history of the slide rule and its use in the context of electrification examines the roles of analyzers, graphs, and a whole range of computing artifacts hitherto placed under the allegedly inferior class of analog computers shows how the analog and the digital are really inseparable, with perceptions thereof depending on either a full or a restricted view of the computing process investigates socially situated comparisons of computing history, including the effects of a political economy of computing (one that takes into account cost and ownership of computing artifacts) assesses concealment of analog-machine labor through encasement (“black-boxing”) Historians of computing, as well as those of technology and science (especially, energy), will find this well-argued and presented history of calculation and computation in the mechanical and electrical eras an indispensable resource. The work is a natural textbook companion for history of computing courses, and will also appeal to the broader readership of curious computer scientists and engineers, as well as those who generally just have a yearn to learn the contextual background to the current digital age. "In this fascinating, original work, Tympanis indispensably intertwines the histories of analog and digital computing, showing them to be inseparable from the evolution of social and economic conditions. " Prof. David Mindell, MIT

In 1956, two Bell Labs scientists discovered the scientific formula for getting rich. One was mathematician Claude Shannon, neurotic father of our digital age, whose genius is ranked with Einstein's. The other was John L. Kelly Jr., a Texas-born, gun-toting physicist. Together they applied the science of information theory—the basis of computers and the Internet—to the problem of making as much money as possible, as fast as possible. Shannon and MIT mathematician Edward O. Thorp took the "Kelly formula" to Las Vegas. It worked. They realized that there was even more money to be made in the stock market. Thorp used the Kelly system with his phenomenally successful hedge fund, Princeton-Newport Partners. Shannon became a successful investor, too, topping even Warren Buffett's rate of return. Fortune's Formula traces how the Kelly formula sparked controversy even as it made fortunes at racetracks, casinos, and trading desks. It reveals the dark side of this alluring scheme, which is founded on exploiting an insider's edge. Shannon believed it was possible for a smart investor to beat the market—and William Poundstone's Fortune's Formula will convince you that he was right.

In 1993, the first edition of *The Electrical Engineering Handbook* set a new standard for breadth and depth of coverage in an engineering reference work. Now, this classic has been substantially revised and updated to include the latest information on all the important topics in electrical engineering today. Every electrical engineer should have an opportunity to expand his expertise with this definitive guide. In a single volume, this handbook provides a complete reference to answer the questions encountered by practicing engineers in industry, government, or academia. This well-organized book is divided into 12 major sections that encompass the entire field of electrical engineering, including circuits, signal processing, electronics, electromagnetics, electrical effects and devices, and energy, and the emerging trends in the fields of communications, digital devices, computer engineering, systems, and biomedical engineering. A compendium of physical, chemical, material, and mathematical data completes this comprehensive resource. Every major topic is thoroughly covered and every important concept is defined, described, and illustrated. Conceptually challenging but carefully explained articles are equally valuable to the practicing engineer, researchers, and students. A distinguished advisory board and contributors including many of the leading authors, professors, and researchers in the field today assist noted author and professor Richard Dorf in offering complete coverage of this rapidly expanding field. No other single volume available today offers this combination of broad coverage and depth of exploration of the topics. *The Electrical Engineering Handbook* will be an invaluable resource for electrical engineers for years to come.

In the mid-eighteenth century, Swiss-born mathematician Leonhard Euler developed a formula so innovative and complex that it continues to inspire research, discussion, and even the occasional limerick. Dr. Euler's Fabulous Formula shares the fascinating story of this groundbreaking formula—long regarded as the gold standard for mathematical beauty—and shows why it still lies at the heart of complex number theory. In some ways a sequel to Nahin's *An Imaginary Tale*, this book examines the many applications of complex numbers alongside intriguing stories from the history of mathematics. Dr. Euler's Fabulous Formula is accessible to any reader familiar with calculus and differential equations, and promises to inspire mathematicians for years to come.

For ease of use, this edition has been divided into the following subject sections: general principles; materials and processes; control, power electronics and drives; environment; power generation; transmission and distribution; power systems; sectors of electricity use. New chapters and major revisions include: industrial instrumentation; digital control systems; programmable controllers; electronic power conversion; environmental control; hazardous area technology; electromagnetic compatibility; alternative energy sources; alternating current generators; electromagnetic transients; power system planning; reactive power plant and FACTS controllers; electricity economics and trading; power quality. *An essential source of techniques, data and principles for all practising electrical engineers *Written by an international team of experts from engineering companies and universities *Includes a major new section on control systems, PLCs and microprocessors

Provides One Unified Formula That Gives Solutions to Several Types of GSEs Generalized Sylvester equations (GSEs) are applied in many fields, including applied mathematics, systems and control, and signal processing. Generalized Sylvester Equations: Unified Parametric Solutions presents a unified parametric approach for solving various types of GSEs. In an extremely

neat and elegant matrix form, the book provides a single unified parametric solution formula for all the types of GSEs, which further reduces to a specific clear vector form when the parameter matrix F in the equations is a Jordan matrix. Particularly, when the parameter matrix F is diagonal, the reduced vector form becomes extremely simple. The first chapter introduces several types of GSEs and gives a brief overview of solutions to GSEs. The two subsequent chapters then show the importance of GSEs using four typical control design applications and discuss the F -coprimeness of a pair of polynomial matrices. The next several chapters deal with parametric solutions to GSEs. The final two chapters present analytical solutions to normal Sylvester equations (NSEs), including the well-known continuous- and discrete-time Lyapunov equations. An appendix provides the proofs of some theorems. The book can be used as a reference for graduate and senior undergraduate courses in applied mathematics and control systems analysis and design. It will also be useful to readers interested in research and applications based on Sylvester equations.

THE DIGITAL INFORMATION AGE SECOND EDITION by bestselling author Roman Kuc is designed for students considering electrical engineering as a major, and non-engineering majors interested in understanding digital communication systems. Communication between humans and smart devices takes place through sensors and actuators, with logic circuits manipulating binary data to implement useful tasks. The text then examines the basic problem of communicating audio and video data over a network connecting computers and smart devices. System operation is described from analog-to-digital conversion, signals that encode data, through the processing that extracts data from noise-corrupted signals and error correction techniques, to data packet transmission over wired and wireless networks. Basic topics from probability and digital signal processing are presented as needed and illustrated with relevant examples. Ideas are illustrated and extended by problems and projects completed in Excel, with sophistication that evolves along with the course, starting with spreadsheet formulas and graphs, through macros, to simple Visual Basic for Applications (VBA) programming that produces animations that simulate system operation. The accrued facility with Excel techniques is a course outcome valued by students in all majors. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Electronics Reliability—Calculation and Design provides an introduction to the fundamental concepts of reliability. The increasing complexity of electronic equipment has made problems in designing and manufacturing a reliable product more and more difficult. Specific techniques have been developed that enable designers to integrate reliability into their products, and reliability has become a science in its own right. The book begins with a discussion of basic mathematical and statistical concepts, including arithmetic mean, frequency distribution, median and mode, scatter or dispersion of measurements, and the normal and binomial distributions. Separate chapters deal with techniques for calculating equipment and system reliability; safety and derating factors; and the effects of constructional methods on reliability. Subsequent chapters cover environmental effects on reliability; improved reliability through microelectronics or integrated circuits; and failure rates for electronic components. Each chapter concludes with questions to enable students to test their understanding of the topics discussed. This book offers students an introduction to the subject of reliability in a form that is easily assimilated. It also serves as a reference to the various aspects contributing towards

increased reliability of both electronic equipment and complete systems.

Pocket Book of Electrical Engineering Formulas provides key formulas used in practically all areas of electrical engineering and applied mathematics. This handy, pocket-sized guide has been organized by topic field to make finding information quick and easy. The book features an extensive index and is an excellent quick reference for electrical engineers, educators, and students. This book constitutes the refereed proceedings of the 8th International Conference on Theory and Applications of Satisfiability Testing, SAT 2005, held in St Andrews, Scotland in June 2005. The 26 revised full papers presented together with 16 revised short papers presented as posters during the technical programme were carefully selected from 73 submissions. The whole spectrum of research in propositional and quantified Boolean formula satisfiability testing is covered including proof systems, search techniques, probabilistic analysis of algorithms and their properties, problem encodings, industrial applications, specific tools, case studies, and empirical results.

Electrification of Emuhun Village in Edo State, Nigeria Using Renewable Energy Mix; Underlying Principle with 16.5 MWh Annually by Engr. Eur Ing. Dr. Robinson Ehiorobo Electrification of Emuhun Village in Edo State, Nigeria is a domicile of the application of renewable energy. A generic ideology of the principle of renewable energy is demystified, with root emphasis based on solar photovoltaic method for the provision of water and electrification for rural dwellers. Author Engr. Eur Ing. Dr. Robinson Ehiorobo's three-decade working experience on electricity, coupled with several additional educational updating, necessitated his opinion to better his homeland with free benefits of his scientific capability. The reader in the higher institution, namely university, polytechnic, and technical colleges, will find the book very useful for supporting their educational upbringing. Most importantly, the application technician or engineer will find the book very useful for practical challenges for design and implementations rationale. The project is replicable with full understanding of the principle of simple design calculations included in the book.

This volume is the third edition of the first-ever elementary book on the Langevin equation method for the solution of problems involving the translational and rotational Brownian motion of particles and spins in a potential highlighting modern applications in physics, chemistry, electrical engineering, and so on. In order to improve the presentation, to accommodate all the new developments, and to appeal to the specialized interests of the various communities involved, the book has been extensively rewritten and a very large amount of new material has been added. This has been done in order to present a comprehensive overview of the subject emphasizing via a synergetic approach that seemingly unrelated physical problems involving random noise may be described using virtually identical mathematical methods in the spirit of the founders of the subject, viz., Einstein, Langevin, Smoluchowski, Kramers, The book has been written in such a way that all the material should be accessible both to an advanced researcher and a beginning graduate student. It draws together, in a coherent fashion, a variety of results which have hitherto been available only in the form of scattered research papers and review articles.

This book is the collection of the contributions offered at the International Symposium on Electromagnetic Fields in Electrical Engineering, ISEF '87, held in Pavia, Italy, in September 1987. The Symposium was attended by specialists

engaged in both theoretical and applied research in low-frequency electromagnetism. The charming atmosphere of Pavia and its ancient university provided a very effective environment to discuss the latest results in the field and, at the same time, to enjoy the company of colleagues and friends coming from over 15 countries. The contributions have been grouped into 7 chapters devoted to fundamental problems, computer programs, transformers, rotating electrical machines, mechanical and thermal effects, various applications and synthesis, respectively. Such a classification is merely to help the reader because a few papers could be put in several chapters. Over the past two decades electromagnetic field computations have received a big impulse by the large availability of digital computers with better and better performances in speed and capacity. Many various methods have been developed but not all of them appear convenient enough for practical engineering use. In fact, the technical and industrial challenges set some principal attributes and criteria for good computation methods. They should be relatively easy to use, fit into moderately sized computers, yield useful design data, maintain flexibility with minimum cost in time and effort.

The field of electrical engineering is very innovative-new products and new ideas are continually being developed. Yet all these innovations are based on the fundamental principles of electrical engineering: Ohm's law, Kirchhoff's laws, feedback control, waveforms, capacitance, resistance, inductance, electricity, magnetism, current, voltage, power, energy. It is these basic fundamentals which are tested for in the Professional Engineering Examination (PE Exam). This text provides an organized review of the basic electrical engineering fundamentals. It is an outgrowth of an electrical engineering refresher course taught by the author to candidates preparing for the Professional Engineering Examination--a course which has enabled scores of electrical engineers in Minnesota and Wisconsin to successfully pass the PE Exam. The material is representative of the type of questions appearing in the PE Exams prepared by the National Council of Engineering Examiners (NCEE) over the past twelve years. Each problem in the text has been carefully selected to illustrate a specific concept. Included with each problem is at least one solution. Although the solutions have been carefully checked, both by the author and by students, there may be differences of interpretation. Also, in some cases certain assumptions may need to be made prior to problem solution, and since these are individual, the final answer may also differ. The assumptions will vary from individual author has attempted to keep the requirements for assumptions and interpretation to a minimum.

Written by experienced teachers and recognized experts in electrical engineering, Handbook of Electrical Engineering Calculations identifies and solves the seminal problems with numerical techniques for the principal branches of the field -- electric power, electromagnetic fields, signal analysis, communication systems, control systems, and computer engineering. It covers electric power engineering, electromagnetics, algorithms used in signal analysis, communication

systems, algorithms used in control systems, and computer engineering. Illustrated with detailed equations, helpful drawings, and easy-to-understand tables, the book serves as a practical, on-the-job reference.

When Charles Proteus Steinmetz (1865-1923) died suddenly at the height of his fame, his face was as familiar to Americans as that of Babe Ruth, Henry Ford, or Jack Dempsey. Newspapers quoted his views on religion, politics (he was a Socialist), science, and future technological wonders. All were intrigued by the Horatio Alger tale of the penniless, hunchbacked German immigrant who rose to fame as the Wizard of Science, chief engineer at General Electric, and symbol of the new breed of scientists who daily surpassed the feats of Thomas Alva Edison. This intellectual biography follows Steinmetz from his education in Germany to his rise as General Electric's chief consulting engineer. Steinmetz obtained nearly 200 patents; he made his most important contributions in electrical energy loss (or hysteresis), the understanding and wider use of alternating current, and high-voltage power transmission. General Electric became Steinmetz's home, his identity, and a platform from which he stepped onto the wider stage of world affairs. As leader of the American Institute of Electrical Engineers, Socialist councilman in Schenectady, New York, and part-time professor at Union College, Steinmetz attempted to "engineer" society in the direction of a technocratic utopia by promoting welfare capitalism, Lenin's electrification of the Soviet Union, and other schemes — all with limited success. In a life filled with contrasts, perhaps even Steinmetz himself, a prominent Socialist serving as chief engineer of a major corporation, was not always able to separate the myth from the man. Steinmetz: Engineer and Socialist was the subject of the 2014 PBS documentary film, "Divine Discontent." "Well informed by recent studies of similar mythologizing, Kline explains both the rise and decline of Steinmetz's popular reputation." — Robert Friedel, Science "Kline's explanations are lucid and he offers broader insights about science and technology that will interest all cultural historians." — Mark Pittenger, Journal of American History "Steinmetz not only provides the first comprehensive, technically sophisticated analysis of Steinmetz's engineering achievements, but also carefully examines his influential political and social writings, and judiciously dissects the making of the 'Wizard of Schenectady' legend." — David Sicilia, Reviews in American History

The 2016 International Conference on Automotive Engineering, Mechanical and Electrical Engineering (AEMEE 2016) was held December 9-11, 2016 in Hong Kong, China. AEMEE 2016 was a platform for presenting excellent results and new challenges facing the fields of automotive, mechanical and electrical engineering. Automotive, Mechanical and Electrical Engineering brings together a wide range of contributions from industry and governmental experts and academics, experienced in engineering, design and research. Papers have been categorized under the following headings: Automotive Engineering and Rail Transit Engineering. Mechanical, Manufacturing, Process Engineering. Network, Communications and Applied Information Technologies. Technologies in Energy and Power, Cell, Engines,

Generators, Electric Vehicles. System Test and Diagnosis, Monitoring and Identification, Video and Image Processing. Applied and Computational Mathematics, Methods, Algorithms and Optimization. Technologies in Electrical and Electronic, Control and Automation. Industrial Production, Manufacturing, Management and Logistics.

This book provides, for the first time, a broad and deep treatment of the fields of both ultra low power electronics and bioelectronics. It discusses fundamental principles and circuits for ultra low power electronic design and their applications in biomedical systems. It also discusses how ultra energy efficient cellular and neural systems in biology can inspire revolutionary low power architectures in mixed-signal and RF electronics. The book presents a unique, unifying view of ultra low power analog and digital electronics and emphasizes the use of the ultra energy efficient subthreshold regime of transistor operation in both. Chapters on batteries, energy harvesting, and the future of energy provide an understanding of fundamental relationships between energy use and energy generation at small scales and at large scales. A wealth of insights and examples from brain implants, cochlear implants, bio-molecular sensing, cardiac devices, and bio-inspired systems make the book useful and engaging for students and practicing engineers.

Electrical Engineering 101 covers the basic theory and practice of electronics, starting by answering the question "What is electricity?" It goes on to explain the fundamental principles and components, relating them constantly to real-world examples. Sections on tools and troubleshooting give engineers deeper understanding and the know-how to create and maintain their own electronic design projects. Unlike other books that simply describe electronics and provide step-by-step build instructions, EE101 delves into how and why electricity and electronics work, giving the reader the tools to take their electronics education to the next level. It is written in a down-to-earth style and explains jargon, technical terms and schematics as they arise. The author builds a genuine understanding of the fundamentals and shows how they can be applied to a range of engineering problems. This third edition includes more real-world examples and a glossary of formulae. It contains new coverage of: Microcontrollers FPGAs Classes of components Memory (RAM, ROM, etc.) Surface mount High speed design Board layout Advanced digital electronics (e.g. processors) Transistor circuits and circuit design Op-amp and logic circuits Use of test equipment Gives readers a simple explanation of complex concepts, in terms they can understand and relate to everyday life. Updated content throughout and new material on the latest technological advances. Provides readers with an invaluable set of tools and references that they can use in their everyday work.

With over 450 unit conversions, 180 term definitions, plus every significant engineering subject with applicable formulas, this guide includes properties of materials, formulas for geometric figures, and formulas for structural sections. A CD-ROM allows users to quickly perform dynamic calculations and analysis on over 100 of the most popular equations in the

book.

Signal processing is a broad and timeless area. The term "signal" includes audio, video, speech, image, communication, geophysical, sonar, radar, medical, and more. Signal processing applies to the theory and application of filtering, coding, transmitting, estimating, detecting, analyzing, recognizing, synthesizing, recording, and reproducing signals. Handbook of Formulas and Tables for Signal Processing a must-have reference for all engineering professionals involved in signal and image processing. Collecting the most useful formulas and tables - such as integral tables, formulas of algebra, formulas of trigonometry - the text includes: Material for the deterministic and statistical signal processing areas Examples explaining the use of the given formula Numerous definitions Many figures that have been added to special chapters Handbook of Formulas and Tables for Signal Processing brings together - in one textbook - all the equations necessary for signal and image processing for professionals transforming anything from a physical to a manipulated form, creating a new standard for any person starting a future in the broad, extensive area of research.

Annotation Here are 111 problems, solutions, and explanations for the topics on the Electrical Engineering Exam. Easy-to-use tables, charts, graphs, and formulas provide the background needed to solve the problems. Topics covered: * Fundamental Concepts of Electrical Engineering. * Basic Circuits. * Power. * Machinery. * Control Theory. * Electronics. * Communications. * Logic. 30% of this review book is text, and 70% are problems.

Written by prominent experts in the field, this monograph provides the first comprehensive, unified presentation of the structural, algorithmic and applied aspects of the theory of Boolean functions. The book focuses on algebraic representations of Boolean functions, especially disjunctive and conjunctive normal form representations. This framework looks at the fundamental elements of the theory (Boolean equations and satisfiability problems, prime implicants and associated short representations, dualization), an in-depth study of special classes of Boolean functions (quadratic, Horn, shellable, regular, threshold, read-once functions and their characterization by functional equations) and two fruitful generalizations of the concept of Boolean functions (partially defined functions and pseudo-Boolean functions). Several topics are presented here in book form for the first time. Because of the depth and breadth and its emphasis on algorithms and applications, this monograph will have special appeal for researchers and graduate students in discrete mathematics, operations research, computer science, engineering and economics.

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