

# Electrical Circuit Analysis By Bakshi

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Scientific Computing in Electrical Engineering  
Technical Publications

Electrical Circuit Analysis Technical Publications  
**Control System Theory** Technical  
Publications

The book is written for an undergraduate course on the theory of Feedback Control Systems. It provides comprehensive explanation of theory and practice of control system engineering. It elaborates various aspects of time domain and frequency domain analysis and design of control systems. Each chapter starts with the background of the topic. Then it gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The explanations are given using very simple and lucid language. All the chapters are arranged in a specific sequence which helps to build the understanding of the subject in a logical fashion. The book starts with explaining the various types of control systems. Then it explains how to obtain the mathematical models of various types of systems such as electrical, mechanical, thermal and liquid level systems. Then the book includes good coverage of the block diagram and signal flow graph methods of representing the various systems and the reduction methods to obtain simple system from the analysis point of view. The book further illustrates the steady state and transient analysis of control systems. The book covers the fundamental knowledge of controllers used in practice to optimize the performance of the systems. The book emphasizes the detailed analysis of second order systems

as these systems are common in practice and higher order systems can be approximated as second order systems. The book teaches the concept of stability and time domain stability analysis using Routh-Hurwitz method and root locus method. It further explains the fundamentals of frequency domain analysis of the systems including co-relation between time domain and frequency domain. The book gives very simple techniques for stability analysis of the systems in the frequency domain, using Bode plot, Polar plot and Nyquist plot methods. It also explores the concepts of compensation and design of the control systems in time domain and frequency domain. The classical approach loses the importance of initial conditions in the systems. Thus the book provides the detailed explanation of modern approach of analysis which is the state variable analysis of the systems including methods of finding the state transition matrix, solution of state equation and the concepts of controllability and observability. The book also introduces the concept of discrete time systems including digital and sample data systems, z-transform, difference equations, state space representation, pulse transfer functions and stability of linear discrete time systems. The variety of solved examples is the feature of this book which helps to inculcate the knowledge of the design and analysis of the control systems in the students. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

## **Basic Electrical & Instrumentation Engineering** Technical Publications

The book covers all the aspects of theory, analysis, and design of Electron Devices and Circuits for the undergraduate course. The concepts of p-n junction devices, BJT, JFET, MOSFET, electronic devices including UJT, thyristors, IGBT, Amplifier circuits-BJT, JFET and MOSFET

amplifiers, multistage and differential amplifiers, feedback amplifiers, and oscillators are explained comprehensively. The book explains various p-n junction devices, including diode, LED, laser diode, Zener diode, and Zener diode regulator. The different types of rectifiers are explained in support. The book covers the construction, operation, and characteristics of BJT, JFET, MOSFET, UJT, Thyristors - SCR, Diac and Triac, and IGBT. It explains the biasing of BJT, JFET, and MOSFET amplifiers, basic BJT, JFET, and MOSFET amplifiers with h-parameters and r-parameters equivalent circuits, multistage amplifiers, differential amplifiers, BiCMOS amplifier, single tuned amplifiers, neutralization methods, power amplifiers, and frequency response. Finally, the book incorporates a detailed discussion of the analysis of the current series, voltage series, current shunt, and voltage shunt feedback amplifiers. The book also includes the discussion of the Barkhausen criterion for oscillations and the detailed analysis of various oscillator circuits, including RC phase shift, Wien bridge, Hartley, Colpitt's, Clapp, and crystal oscillators. The book uses straightforward and lucid language to explain each topic. The book provides the logical method of describing the various complicated issues and stepwise methods to make understanding easy. The variety of solved examples is the feature of this book. The book explains the subject's philosophy, which makes understanding the concepts evident and makes the subject more interesting.

## Network Analysis & Synthesis Technical Publications

The importance of various electrical machines is well known in the various engineering fields. The book provides comprehensive coverage of the synchronous generators (alternators), synchronous motors, three phase and single phase induction motors and various special machines. The book is structured to cover the key aspects of the course Electrical Machines - II. The book starts with the explanation of basics of synchronous generators including construction, winding details and e.m.f. equation. The book then explains the concept of armature reaction, phasor diagrams, regulation and various methods of finding the regulation of alternator.

Stepwise explanation and simple techniques used to elaborate these methods is the feature of this book. The book further explains the concept of synchronization of alternators, two reaction theory and parallel operation of alternators. The chapter on synchronous motor provides the detailed discussion of construction, working principle, behavior on load, analysis of phasor diagram, Vee and Inverted Vee curves, hunting and applications. The book further explains the three phase induction motors in detail. It includes the construction, working, effect of slip, torque equation, torque ratios, torque-slip characteristics, losses, power flow, equivalent circuit, effect of harmonics on the performance and applications. This chapter includes the discussion of induction generator and synchronous induction motor. The detailed discussion of circle diagram is also included in the book. The book teaches the various starting methods, speed control methods and electrical braking methods of three phase induction motors. Finally, the book gives the explanation of various single phase induction motors and special machines such as reluctance motor, hysteresis motor, repulsion motor, servomotors and stepper motors. The discussion of magnetic levitation is also incorporated in the book. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self explanatory diagrams and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Basic Electrical Engineering Technical Publications

The book covers all the aspects of Network Analysis for undergraduate course. The book provides comprehensive coverage of circuit analysis and simplification techniques, coupled circuits, network theorems, transient analysis, Laplace transform, network functions, two port network parameters, network topology and network synthesis with the help of large number of solved problems. The book starts with explaining the various circuit variables, elements and sources. Then it explains different network simplification techniques including mesh analysis, node analysis and source shifting. The basics of coupled circuits and dot conventions are also explained in support. The book covers the application of various network theorems to d.c. and a.c. circuits. The importance of initial conditions and transient analysis of various networks is also explained in the book. The Laplace transform plays an important role in the network analysis. The chapter on Laplace transform includes properties of Laplace transform and its application in the network analysis. The book includes the discussion of network functions of one and two port networks.

The book covers the various aspects of two port network parameters along with the conditions of symmetry and reciprocity. It also derives the interrelationships between the two port network parameters. The book incorporates the discussion of network topology. Finally the book covers the fundamentals of network synthesis and synthesis of LC, RC and RL networks. The book uses plain and lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of solved examples is the feature of this book. The book explains the philosophy of the subject which makes the understanding of the subject very clear and makes the subject more interesting. The students have to omit nothing and possibly have to cover nothing more. Op Amps for Everyone Technical Publications Electric Circuit Analysis is designed for undergraduate course on basic electric circuits. The book builds on the subject from its basic principles. Spread over fourteen chapters, the book can be taught with varying degree of emphasis based on the course requirement. Written in a student-friendly manner, its narrative style places adequate stress on the principles that govern the behaviour of electric circuits.

Circuits and Networks: Analysis and Synthesis, 5 Technical Publications  
 Circuit Elements & Kirchoff's Laws  
 Lumped & Discrete Circuit Elements,  
 Characterization of Resistors, Capacitors & Inductors in Terms of Their Livearity & Time Dependence Nature, Characteristics of Independent & Dependent Sources, KCL & KVL for Circuits with Dependent & Independent. Sources, Terminal Characteristics of Active Circuit Elements like Diodes, OPAMPS & transistors, Dot Convention for Coupled Inductor. Time Domain Analysis of Circuits Initial and Final Conditions on Network Elements, Differential Equations & integrodifferential Equations of First-and Second Order System, Step and Impulse response of First and Second-Order System, Zero-Input & Zero-State Response. Sinusoidal Steady-State Analysis Difference of Sinusoidal Steady^ State, Difference between a Phasor and a Vector. Concept of Impedance and Admittance, Node & Mesh Analysis in the Sinusoidal Steady State, Network Theorems Like Superposition, Thevenin's & Superposition in the Sinusoidal Steady State, Present Circuits (both Series & Parallel) Coupling Elements and Coupled Circuits Coupled Inductors & Their Characterisation, Co-efficient of Coupling, Multiwin'ding Inductors & their I Inductance Matrix, Double Tuned Circuits. Transform Domain Analysis of Networks The philosophy of Transform Methods, The Laplace Transform, Use of Laplace Transform for the Solution of Integra.

Differential Equations, Transforms of Wave Forms Synthesized with Step, Ramp Gate and Sinusoidal Fuctions, The transformed Network, Network Theorems (the Venin, Norton, Maximum power. Superposition & Reciprocity) in transform Domain. Network Functions The concept of complex frequency, Concept of Ports, Network Functions of one Port & Two ports, Calculation of Network Functions for General Networks, Pole & Zeros of Network Functions of Different Kinds, Time Domain Behaviour from Pole-Zero plots. Two Port Networks Relationship of Two-port Variables, Short Circuit Admittance & Parameters, Open Circuit Impedance, Transmission Parameters, Hybrid Parameters, Relationship between Parameters Sets, Interconnection between Two-ports, Terminated Two-ports. Fourier Series & Fourier Transforms Concept of Signal Spectra, Fourier Series Co-efficients of a periodic Wave-form, Waveform Symmetrics, Exponential Form of Fourier Series, Steady State Response to Periodic Signals, Fourier integral & transform. Properties of Fourier Transform, Applications in Network analysis. Network Synthesis of One-port Networks with Two Kind of Elements Concept of Positive real functions, Hurwitz polynomials, Properties of L-C, RL & RC immittance function, Synthesis of RC, RL & LC immittance functions in cauer, Foster & mixed canonical form. Topological Analysis of electrical Networks Concept of Network Graphs, Incidence matrix. Cut-sets and loops. Fundamental cut-set and loop matrices, Dual graphs. Cut-set and loop Analysis. Electrical and Electronic Principles New Age International Basic Circuit Concepts Lumped circuits- circuit elements, ideal sources (independent and dependent), linear passive parameters R, L and C; V-I relationship of circuit elements; sinusoidal voltage and current; RMS value; form factor; Kirchoff's Laws; analysis of series and parallel circuits - network reduction; voltage and current division, source transformation, star/delta transformation. Transient Analysis of First and Second Order Circuits Source free response of RL and RC circuits; forced (step) response of RL and RC circuits; source free response of RLC series circuit; forced (step) response of RLC series circuit; forced response of RL, RC and RLC series circuit to sinusoidal excitation; time constant and natural frequency of oscillation of circuits. Laplace Transform application to the solution of RL, RC and RLC circuits - initial and finial value theorems and applications, concept of complex frequency, driving point

and transfer impedance, poles and zeros of network function. Sinusoidal Steady State Analysis Concept of phasor and complex impedance/admittance; Analysis of simple series and parallel circuits - active power, reactive power, apparent power (volt ampere), power factor and energy associated with these circuits; concept of complex power phasor diagram, impedance triangle and power triangle associated with these circuits. Resonance in series and parallel circuits - Q factor, half-power frequencies and bandwidth of resonant circuits. Multi Dimensional Circuit Analysis and Network Theorems Node-voltage analysis of multi mode circuit with current sources, rules for constructing nodal admittance matrix  $[Y]$  for solving matrix equation  $[Y]V=I$ , mesh-current analysis of multi node circuits with voltage sources, rules for constructing mesh impedance matrix  $[Z]$  for solving matrix equation  $[Z]I=V$ . Superposition theorem, Thevenin's theorem, Norton's theorem, Reciprocity theorem, Compensation theorem, Tellegen's theorem, Millman's theorem, maximum power transfer theorem for variable resistance load, variable impedance load and variable resistance and fixed reactance load. Coupled Circuits and Three Phase Circuits Coupled circuits- mutual inductance, coefficient of coupling, dot convention; analysis of simple coupled circuits. Three phase circuits - three phase balanced / unbalanced voltage sources, symmetrical components, analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads (balanced and unbalanced), phasor diagram of voltages and currents, power and power factor measurements in three phase circuits. Electric Circuit Analysis PHI Learning Pvt. Ltd. Electrical Circuit Theory and Technology is a fully comprehensive text for courses in electrical and electronic principles, circuit theory and electrical technology. The coverage takes students from the fundamentals of the subject, to the completion of a first year degree level course. Thus, this book is ideal for students studying engineering for the first time, and is also suitable for pre-degree vocational courses, especially where progression to higher levels of study is likely. John Bird's approach, based on 700 worked examples supported by over 1000 problems (including answers), is ideal for students of a wide range of abilities, and can be worked through at the student's own pace. Theory is kept to a minimum, placing a firm emphasis on problem-solving skills, and making this a thoroughly practical introduction to these core subjects in the electrical and electronic engineering curriculum. This revised edition includes new material on transients and laplace transforms, with the content carefully matched to typical undergraduate modules. Free Tutor

Support Material including full worked solutions to the assessment papers featured in the book will be available at <http://textbooks.elsevier.com/>. Material is only available to lecturers who have adopted the text as an essential purchase. In order to obtain your password to access the material please follow the guidelines in the book. Electronic Circuit Analysis for JNTU Technical Publications This collection of selected papers presented at the 11th International Conference on Scientific Computing in Electrical Engineering (SCEE), held in St. Wolfgang, Austria, in 2016, showcases the state of the art in SCEE. The aim of the SCEE 2016 conference was to bring together scientists from academia and industry, mathematicians, electrical engineers, computer scientists, and physicists, and to promote intensive discussions on industrially relevant mathematical problems, with an emphasis on the modeling and numerical simulation of electronic circuits and devices, electromagnetic fields, and coupled problems. The focus in methodology was on model order reduction and uncertainty quantification. This extensive reference work is divided into six parts: Computational Electromagnetics, Circuit and Device Modeling and Simulation, Coupled Problems and Multi Scale Approaches in Space and Time, Mathematical and Computational Methods Including Uncertainty Quantification, Model Order Reduction, and Industrial Applications. Each part starts with a general introduction, followed by the respective contributions. This book will appeal to mathematicians and electrical engineers. Further, it introduces algorithm and program developers to recent advances in the other fields, while industry experts will be introduced to new programming tools and mathematical methods. SCEE 2016, St. Wolfgang, Austria, October 2016 Technical Publications The fundamentals and implementation of digital electronics are essential to understanding the design and working of consumer/industrial electronics, communications, embedded systems, computers, security and military equipment. Devices used in applications such as these are constantly decreasing in size and employing more complex technology. It is therefore essential for engineers and students to understand the fundamentals, implementation and application principles of digital electronics, devices and integrated circuits. This is so that they can use the most appropriate and effective technique to suit their technical need. This book provides practical and comprehensive coverage of digital electronics, bringing together information on fundamental theory, operational aspects and potential applications. With worked problems, examples, and review questions for each chapter, Digital Electronics includes: information on number systems, binary codes, digital arithmetic, logic gates and families, and

Boolean algebra; an in-depth look at multiplexers, de-multiplexers, devices for arithmetic operations, flip-flops and related devices, counters and registers, and data conversion circuits; up-to-date coverage of recent application fields, such as programmable logic devices, microprocessors, microcontrollers, digital troubleshooting and digital instrumentation. A comprehensive, must-read book on digital electronics for senior undergraduate and graduate students of electrical, electronics and computer engineering, and a valuable reference book for professionals and researchers. Electromagnetic Field Theory Technical Publications Basic Concepts Practical sources, source transformation, network reduction using star-delta transformation. Loop and node analysis with linearly dependent and independent sources for DC and AC networks. Network Topology Graph of network, Concept of a tree and co-tree, incidence matrix, tieset and cut-set schedules, formulation of equilibrium equations in matrix form, solution of resistive networks, principles of duality. Network Theorems Superposition, Reciprocity, Thevenin's, Norton's, Maximum power transfer and Millman's theorems. Resonant Circuits Series and parallel resonance, frequency-response of series and parallel circuits, Q-factor, Bandwidth. Transient Behaviour and Initial Conditions Behaviour of circuit element under switching condition and their representation, evaluation of initial and final conditions in RL, RC and RLC circuits for AC and DC excitations. Laplace Transformation and Applications Solution of networks, step, ramp and impulse functions, waveform synthesis, initial and final values, convolution integral, Transformed networks and their solution. Two Port Network Parameters Short circuit admittance parameters, open circuit impedance parameters, transmission parameters, hybrid parameters, relationship between parameters sets. Digital Electronics Springer The importance of electric motors is well known in the various engineering fields. The book provides comprehensive coverage of the various types of electric motors including d.c. motors, three phase and single phase induction motors, synchronous motors, universal motor, a.c. servomotor, linear induction motor and stepper motors. The book covers all the details of d.c. motors including torque equation, back e.m.f., characteristics, types of starters, speed control methods and applications. The book also covers the various testing methods of d.c. motors such as Swinburne's test, brake test, retardation test, field test and Hopkinson's test. The book further explains the three phase induction motors in detail. It includes the production of rotating magnetic field, construction, working, effect of slip, torque equation, torque ratios, torque-slip characteristics, losses, power flow, equivalent circuit, effect of harmonics on the performance, circle diagram and applications. This chapter also includes the discussion of induction generator. The book teaches the various starting

methods and speed control methods of three phase induction motors. The book incorporates the explanation of various single phase induction motors. The chapter on synchronous motor provides the detailed discussion of construction, working principle, behavior on load, analysis of phasor diagram, Vee and Inverted Vee curves, hunting, synchronous condenser and applications. The book also teaches the various special machines such as single phase commutator motors, universal motor, a.c. servomotor, linear induction motor and stepper motors. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. Each chapter is well supported with necessary illustrations, self explanatory diagrams and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

**Electronic Circuits II Pearson Education India**  
The importance of electronic measuring instruments and transducers is well known in the various engineering fields. The book provides comprehensive coverage of various electronic measuring instruments, transducers, data acquisition system, oscilloscopes and measurement of physical parameters. The book starts with explaining the theory of measurement including characteristics of instruments, classification, statistical analysis and limiting errors. Then the book explains the various analog and digital instruments such as average and true rms responding voltmeters, chopper and sampling voltmeter, types of digital voltmeters, multimeter and ohmmeter. It also includes the discussion of high frequency impedance measurement. The book further explains types of signal generators and various signal analyzers such as wave analyzer, logic analyzer, distortion analyzer and power analyzer. The book teaches various d.c. and a.c. bridges along with necessary derivations and phasor diagrams. The book incorporates the discussion of various types of conventional and special purpose oscilloscopes. The book includes the discussion of time and frequency measurement and types of recorders. The chapter on transducers is dedicated to the detailed discussion of various types of transducers. The book also includes the measurement of various physical parameters such as flow, displacement, velocity, force, pressure and torque. Finally, it incorporates the discussion of data acquisition system. Each chapter gives the conceptual knowledge about the topic dividing it in various sections and subsections. Each chapter provides the detailed explanation of the topic, practical examples and variety of solved problems. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

Power Electronics Electrical Circuit Analysis

This study guide is designed for students taking courses in electrical circuit analysis. The book includes examples, questions, and exercises that will help electrical engineering students to review and sharpen their knowledge of the subject and enhance their performance in the classroom. Offering detailed solutions, multiple methods for solving problems, and clear explanations of concepts, this hands-on guide will improve student's problem-solving skills and basic understanding of the topics covered in electric circuit analysis courses.

**Electronic Circuit Analysis Technical Publications**  
Diode Circuits Diode resistance, Diode equivalent circuits, Transition and diffusion capacitance, Reverse recovery time, Load line analysis, Rectifiers, Clippers and clampers. Transistor Biasing Operating point, Fixed bias circuits, Emitter stabilized biased circuits, Voltage divider biased, D.C. bias with voltage feedback, Miscellaneous bias configurations, Design operations, Transistor switching networks, PNP transistors, Bias stabilization. Transistor at Low Frequencies BJT transistor modeling, Hybrid equivalent model, CE fixed bias configuration, Voltage divider bias, Emitter follower, CB configuration, Collector feedback configuration, Hybrid equivalent model. Transistor Frequency Response General frequency considerations, Low frequency response, Miller effect capacitance, High frequency response, Multistage frequency effects. General Amplifiers Cascade connections, Cascode connections, Darlington connections. Feedback Amplifier Feedback concept, Feedback connections type, Practical feedback circuits. Power Amplifiers Definitions and amplifier types, Series fed class A amplifier, Transformer coupled class A amplifiers, Class B amplifier operations, Class B amplifier circuits, Amplifier distortions. Oscillators Oscillator operation, Phase shift oscillator, Wienbridge oscillator, Tuned oscillator circuits, Crystal oscillator. FET Amplifiers FET small signal model, Biasing of FET, Common drain common gate configurations, MOSFETs, FET amplifier networks.

**Switchgear & Protection Technical Publications**

The importance of Electrical Circuit Analysis is well known in the various engineering fields. The book provides comprehensive coverage of mesh and node analysis, various network theorems, analysis of first and second order networks using time and Laplace domain, steady state analysis of a.c. circuits, coupled circuits and dot conventions, network functions, resonance and two port network parameters. The book starts with explaining the network simplification techniques including mesh analysis, node analysis and source shifting. Then the book explains the various network theorems and concept of duality. The book also covers the solution of first and second order networks in time domain. The sinusoidal steady state analysis of electrical circuits is also explained in the book. The book incorporates the discussion of coupled circuits and dot conventions. The Laplace transform plays an important role in the network analysis. The chapter on Laplace

transform includes properties of Laplace transform and its application in the network analysis. The book includes the discussion of network functions of one and two port networks. The book incorporates the detailed discussion of resonant circuits. The book covers the various aspects of two port network parameters along with the conditions of symmetry and reciprocity. It also derives the interrelationships between the two port network parameters. The book uses plain and lucid language to explain each topic. Each chapter gives the conceptual knowledge about the topic dividing it in various sections and subsections. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of solved examples is the feature of this book. The book explains the philosophy of the subject which makes the understanding of the subject very clear and makes the subject more interesting.

**Electronic Circuit Analysis John Wiley & Sons**  
The book, now in its Second Edition, presents the concepts of electrical circuits with easy-to-understand approach based on classroom experience of the authors. It deals with the fundamentals of electric circuits, their components and the mathematical tools used to represent and analyze electrical circuits. This text guides students to analyze and build simple electric circuits. The presentation is very simple to facilitate self-study to the students. A better way to understand the various aspects of electrical circuits is to solve many problems. Keeping this in mind, a large number of solved and unsolved problems have been included. The chapters are arranged logically in a proper sequence so that successive topics build upon earlier topics. Each chapter is supported with necessary illustrations. It serves as a textbook for undergraduate engineering students of multiple disciplines for a course on 'circuit theory' or 'electrical circuit analysis' offered by major technical universities across the country.

**SALIENT FEATURES**

- Difficult topics such as transients, network theorems, two-port networks are presented in a simple manner with numerous examples.
- Short questions with answers are provided at the end of every chapter to help the students to understand the basic laws and theorems.
- Annotations are given at appropriate places to ensure that the students get the gist of the subject matter clearly.

**NEW TO THE SECOND EDITION**

- Incorporates several new solved examples for better understanding of the subject
- Includes objective type questions with answers at the end of the chapters
- Provides an appendix on 'Laplace Transforms'

**Network Analysis McGraw-Hill Education**  
The book is written for an undergraduate course on the Signals and Systems. It provides comprehensive explanation of continuous time signals and systems,

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analogous systems, Fourier transform, Laplace transform, state variable analysis and z-transform analysis of systems. The book starts with the various types of signals and operations on signals. It explains the classification of continuous time signals and systems. Then it includes the discussion of analogous systems. The book provides detailed discussion of Fourier transform representation, properties of Fourier transform and its applications to network analysis. The book also covers the Laplace transform, its properties and network analysis using Laplace transform with and without initial conditions. The book provides the detailed explanation of modern approach of system analysis called the state variable analysis. It includes various methods of state space representation of systems, finding the state transition matrix and solution of state equation. The discussion of network topology is also included in the book. The chapter on z-transform includes the properties of ROC, properties of z-transform, inverse z-transform, z-transform analysis of LTI systems and pulse transfer function. The state space representation of discrete systems is also incorporated in the book. The book uses plain, simple and lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of solved examples is the feature of this book. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.

#### ELECTRICAL CIRCUIT ANALYSIS Springer

The comprehensive study of electric, magnetic and combined fields is nothing but electromagnetic engineering. Along with electronics, electromagnetics plays an important role in other branches. The book is structured to cover the key aspects of the course Electromagnetic Field Theory for undergraduate students. The knowledge of vector analysis is the base of electromagnetic engineering. Hence book starts with the discussion of vector analysis. Then it introduces the basic concepts of electrostatics such as Coulomb's law, electric field intensity due to various charge distributions, electric flux, electric flux density, Gauss's law, divergence and divergence theorem. The book continues to explain the concept of elementary work done, conservative property, electric potential and potential difference and the energy in the electrostatic fields. The detailed discussion of current density, continuity equation, boundary conditions and various types of capacitors is also included in the book. The book provides the discussion of Poisson's and Laplace's equations and their use in variety of practical applications. The chapter on magnetostatics incorporates the explanation of Biot-Savart's law, Ampere's circuital law and its applications, concept of curl, Stoke's theorem, scalar and vector magnetic potentials. The book also includes the concept of force on a moving charge, force on differential current element and

magnetic boundary conditions. The book covers all the details of Faraday's laws, time varying fields, Maxwell's equations and Poynting theorem. Finally, the book provides the detailed study of uniform plane waves including their propagation in free space, perfect dielectrics, lossy dielectrics and good conductors. The book uses plain, lucid language to explain each topic. The book provides the logical method of explaining the various complicated topics and stepwise methods to make the understanding easy. The variety of solved examples is the feature of this book which helps to inculcate the knowledge of the electromagnetics in the students. Each chapter is well supported with necessary illustrations and self-explanatory diagrams. The book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting.