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ELECTRICAL MACHINES Design of Rotating Electrical Machines Electrical Machines Advancements in Electric Machines A Text Book of Electrical Machines ELECTRICAL MACHINES Control Of Electrical Machines Analysis of Electrical Machines Electrical Machines Electrical Machines and Their Applications Design of Electrical Machines Handbook of Electric Machines Electrical Machines Electric Machines Electrical Machine Fundamentals with Numerical Simulation using MATLAB / SIMULINK Electrical Machines & Drives Electrical Machines - I Principles of Electrical Machines Electric Machines Electric Machines and Drives Design of Electrical Machines (D.C. & A.C.) The General Theory of Electrical Machines Matrix Analysis of Electrical Machines Electrical Machines and Drives ELECTRICAL MACHINES : MODELLING AND ANALYSIS SPECIAL ELECTRICAL MACHINES Control of Electric Machines Electrical Machines and Drives Fundamentals of Electric Machines Electrical Machines General Theory of Electrical Machines Sinusoidal Three-Phase Windings of Electric Machines Performance and Control of Electrical Machines Finite Element Analysis of Electrical Machines The Unified Theory of Electrical Machines Analysis of Electric Machinery Electrical Machines Electrical Machines Design and Testing of Electrical Machines The Performance of Electrical Machines

ELECTRICAL MACHINES 2017-11-01

this book covers a brief history of electricity fundamentals of electrostatic and electromagnetic fields torque generation magnetic circuits and detailed performance analysis of transformers and rotating machines it also discusses the concept of generalised machine which can emulate the dynamic and steady state performance of dc and ac machines to serve the specific applications of drive systems in industries many new types of motors are developed in the last few decades a separate chapter on special machines is included in this book so that the students should be made aware of these new developments the book covers the syllabi of many universities in india for a course in electrical machines therefore this book would serve the needs of the undergraduate students of electrical engineering

Design of Rotating Electrical Machines 2009-02-11

in one complete volume this essential reference presents an in depth overview of the theoretical principles and techniques of electrical machine design this book enables you to design rotating electrical machines with its detailed step by step approach to machine design and thorough treatment of all existing and emerging technologies in this field senior electrical engineering students and postgraduates as well as machine designers will find this book invaluable in depth it presents the following machine type definitions different synchronous asynchronous dc and doubly salient reluctance machines an analysis of types of construction external pole internal pole and radial flux machines the properties of rotating electrical machines including the insulation and heat removal options responding to the need for an up to date reference on electrical machine design this book includes exercises with methods for tackling and solutions to real design problems a supplementary website hosts two machine design examples created with mathcad rotor surface magnet permanent magnet machine and squirrel cage induction machine calculations classroom tested material and numerous graphs are features that further make this book an excellent manual and reference to the topic

Electrical Machines 2012-07-31

the text starts with basic functionality and the role of electrical machines in their typical applications the effort of applying coordinate transforms is justified by obtaining a more intuitive concise and easy to use model mathematics reduced to a necessary minimum priority is given to bringing up the system view and explaining the use and external characteristics of machines on their electrical and mechanical ports the aspects of machine design and construction are of secondary importance covering the most relevant concepts relating to machine size torque and power the book explains the losses and secondary effects outlining cases and conditions where some secondary phenomena are neglected while the goal of developing and using machine mathematical models equivalent circuits and mechanical characteristics persists through the book the focus is kept on physical insight of electromechanical conversion process design and construction of practical machines is discussed to the extent needed to understand the principles of operation power losses and cooling and the problems of power supply and control of electric machines details such as the slot shape and the disposition of permanent magnets are covered and their effects on the machine parameters and performance

Advancements in Electric Machines 2008-11-14

traditionally electrical machines are classified into dc commutator brushed machines induction asynchronous machines and synchronous machines these three types of electrical machines are still regarded in many academic curricula as fundamental types despite that dc brushed machines except small machines have been gradually abandoned and pm brushless machines pmbm and switched reluctance machines srm have been in mass production and use for at least two decades recently new topologies of high torque density motors high speed motors integrated motor drives and special motors have been developed progress in electric machines technology is stimulated by new materials new areas of applications impact of power electronics need for energy saving and new technological challenges the development of electric machines in the next few years will mostly be stimulated by computer hardware residential and public applications and transportation systems land sea and air at many universities teaching and research strategy oriented towards electrical machinery is not up to date and has not been changed in some countries almost since the end of the wii in spite of many excellent academic research achievements the academia industry collaboration and technology transfer are

underestimated or quite often neglected underestimation of the role of industry unfamiliarity with new trends and restraint from technology transfer results with time in lack of external nancial support and drastic cline in the number of students interested in power electrical engineering

A Text Book of Electrical Machines 2006-04

this comprehensive up to date introduction to electrical machines is designed to meet the needs of undergraduate electrical engineering students it presents the essential principles of rotating machines and transformers the emphasis is on the performance though the book also introduces the salient features of electrical machine design the book provides accessible student friendly coverage of dc machines transformers three phase induction motor single phase induction motor fractional horsepower motors and synchronous machines the clear writing style of the book enhanced by illustrative figures and simplified explanations of the fundamentals makes it an ideal text for gaining a thorough understanding of the subject of electrical machines key features include detailed coverage of the construction of electrical machines lucid explanations of the principles of operation of electrical machines methods of testing of electrical machines performance calculations of electrical machines wealth of diverse solved examples in each chapter to illustrate the application of theory to practical problems salient features of design of electrical machines objective type questions to help students prepare for competitive exams

ELECTRICAL MACHINES 2007-09-27

this book endeavors to break the stereotype that basic electrical machine courses are limited only to transformers dc brush machines induction machines and wound field synchronous machines it is intended to serve as a textbook for basic courses on electrical machines covering the fundamentals of the electromechanical energy conversion transformers classical electrical machines i e dc brush machines induction machines wound field rotor synchronous machines and modern electrical machines i e switched reluctance machines srm and permanent magnet pm brushless machines in addition to academic research and teaching the author has worked for over 18 years in us high technology corporative businesses providing solutions to problems such as design simulation manufacturing and laboratory testing of large variety of electrical machines for electric traction energy generation marine propulsion and aerospace electric systems

Control Of Electrical Machines 1982

a self contained comprehensive and unified treatment of electrical machines including consideration of their control characteristics in both conventional and semiconductor switched circuits this new edition has been expanded and updated to include material which reflects current thinking and practice all references have been updated to conform to the latest national bs and international iec recommendations and a new appendix has been added which deals more fully with the theory of permanent magnets recognising the growing importance of permanent magnet machines the text is so arranged that selections can be made from it to give a short course for non specialists while the book as a whole will prepare students for more advanced studies in power systems control systems electrical machine design and general industrial applications includes numerous worked examples and tutorial problems with answers

Analysis of Electrical Machines 2016-10-14

offers key concepts of electrical machines embedded with solved examples review questions illustrations and open book questions

Electrical Machines 1984

intended for courses in electrical machinery in which engineering practice is emphasized this text provides coverage of ac and dc machines and stresses industry requirements and the nema standards of professional engineers traditional theories and concepts of mechanical force are also discussed

Electrical Machines and Their Applications 2011-07

a comprehensive text combining all important concepts and topics of electrical machines

and featuring exhaustive simulation models based on matlab simulink electrical machine fundamentals with numerical simulation using matlab simulink provides readers with a basic understanding of all key concepts related to electrical machines including working principles equivalent circuit and analysis it elaborates the fundamentals and offers numerical problems for students to work through uniquely this text includes simulation models of every type of machine described in the book enabling students to design and analyse machines on their own unlike other books on the subject this book meets all the needs of students in electrical machine courses it balances analytical treatment physical explanation and hands on examples and models with a range of difficulty levels the authors present complex ideas in simple easy to understand language allowing students in all engineering disciplines to build a solid foundation in the principles of electrical machines this book includes clear elaboration of fundamental concepts in the area of electrical machines using simple language for optimal and enhanced learning provides wide coverage of topics aligning with the electrical machines syllabi of most international universities contains extensive numerical problems and offers matlab simulink simulation models for the covered machine types describes matlab simulink modelling procedure and introduces the modelling environment to novices covers magnetic circuits transformers rotating machines dc machines electric vehicle motors multiphase machine concept winding design and details finite element analysis and more electrical machine fundamentals with numerical simulation using matlab simulink is a well balanced textbook perfect for undergraduate students in all engineering majors additionally its comprehensive treatment of electrical machines makes it suitable as a reference for researchers in the field

Design of Electrical Machines 1987

containing approximately 200 problems 100 worked the text covers a wide range of topics concerning electrical machines placing particular emphasis upon electrical machine drive applications the theory is concisely reviewed and focuses on features common to all machine types the problems are arranged in order of increasing levels of complexity and discussions of the solutions are included where appropriate to illustrate the engineering implications this second edition includes an important new chapter on mathematical and computer simulation of machine systems and revised discussions of unbalanced operation permanent magnet machines and universal motors new worked examples and tutorial problems have also been added

Handbook of Electric Machines 2017-11-24

the importance of various electrical machines is well known in the various engineering fields the book provides comprehensive coverage of the magnetic circuits magnetic materials single and three phase transformers and d c machines the book is structured to cover the key aspects of the course electrical machines i the book starts with the explanation of basics of magnetic circuits concepts of self and mutual inductances and important magnetic materials then it explains the fundamentals of single phase transformers including the construction phasor diagram equivalent circuit losses efficiency methods of cooling parallel operation and autotransformer the chapter on three phase transformer provides the detailed discussion of construction connections phasor groups parallel operation tap changing transformer and three winding transformer the various testing methods of transformers are also incorporated in the book the book further explains the concept of electromechanical energy conversion including the discussion of singly and multiple excited systems then the book covers all the details of d c generators including construction armature reaction commutation characteristics parallel operation and applications the book also includes the details of d c motors such as characteristics types of starters speed control methods electric braking and permanent magnet d c motors finally the book covers the various testing methods of d c machines including swinburne s test brake test retardation test and hopkinson s test 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 all the chapters are arranged in a proper sequence that permits each topic to build upon earlier studies the book explains the philosophy of the subject which makes the understanding of the concepts very clear and makes the subject more interesting

Electrical Machines 1991

for over 15 years principles of electrical machines is an ideal text for students who look to gain a current and clear understanding of the subject as all theories and

concepts are explained with lucidity and clarity succinctly divided in 14 chapters the book delves into important concepts of the subject which include armature reaction and commutation single phase motors three phase induction motors synchronous motors transformers and alternators with the help of numerous figures and supporting chapter end questions for retention

Electric Machines 2021-04-22

the two major broad applications of electrical energy are information processing and energy processing hence it is no wonder that electric machines have occupied a large and revered space in the field of electrical engineering such an important topic requires a careful approach and charles a gross electric machines offers the most balanced application oriented and modern perspective on electromagnetic machines available written in a style that is both accessible and authoritative this book explores all aspects of electromagnetic mechanical em machines rather than viewing the em machine in isolation the author treats the machine as part of an integrated system of source controller motor and load the discussion progresses systematically through basic machine physics and principles of operation to real world applications and relevant control issues for each type of machine presented coverage ranges from dc induction and synchronous machines to specialized machines such as transformers translational machines and microelectromechanical systems mems stimulating example applications include electric vehicles wind energy and vertical transportation numerous example problems illustrate and reinforce the concepts discussed along with appendices filled with unit conversions and background material electric machines is a succinct in depth and complete guide to understanding electric machines for novel applications

Electrical Machine Fundamentals with Numerical Simulation using MATLAB / SIMULINK 2013-10-22

electrical machines may be analysed utilising one of the three methods viz classical theory unified theory and the generalised theory of electrical machines generalised theory may also be regarded as the matrix theory of electrical machines which requires only a knowledge of the circuit equation elementary matrix algebra and the principle that the power of the system must remain invariant irrespective of the terms in which it is expressed this technique is the best approach to obtain electrical machine performance for both the non specialist and the specialist and that the latter will find in it a powerful tool when he is faced with more complicated performance problems an attempt has been made in this volume to study most of the electrical machines normally covered in undergraduate and postgraduate courses utilising matrix analysis the book also includes some more advanced problems to indicate the power and limitation of the method after an introduction to the theory the same methodology has been applied to static circuits as illustrations then the generalised machines of first and second kinds have been introduced and analysed followed by the different case studies both steady state and transient analysis of conventional machines have been presented in both static and rotating reference frames the beauty of the matrix theory has been projected while developing the equivalent circuits of different machines using revolving field theory where physical concepts have been derived from the mathematical models developed through matrix analysis the latest development of the theory viz the development of state model of different electrical machines has been explained clearly in the text these models may readily be utilised for stability analysis using computers the book has been presented in such a way that it will be a textbook for undergraduate and postgraduate students and also a reference book for the research students in the relevant area and practising engineers the treatment of the book may find wide application for the practising engineers who face day to day problems in the practical field since the theory is based on elementary knowledge of matrix algebra and circuit theory rather than complicated physical laws and hypothesis

Electrical Machines & Drives 2020-11-01

this book aims to offer a thorough study and reference textbook on electrical machines and drives the basic idea is to start from the pure electromagnetic principles to derive the equivalent circuits and steady state equations of the most common electrical machines in the first parts although the book mainly concentrates on rotating field machines the first two chapters are devoted to transformers and dc commutator machines the chapter on transformers is included as an introduction to induction and synchronous machines their electromagnetics and equivalent circuits chapters three and four offer an in depth study of induction and synchronous machines respectively starting from their electromagnetics steady state equations and equivalent circuits are derived from

which their basic properties can be deduced the second part discusses the main power electronic supplies for electrical drives for example rectifiers choppers cycloconverters and inverters much attention is paid to pwm techniques for inverters and the resulting harmonic content in the output waveform in the third part electrical drives are discussed combining the traditional rotating field and dc commutator electrical machines treated in the first part and the power electronics of part two field orientation of induction and synchronous machines are discussed in detail as well as direct torque control in addition also switched reluctance machines and stepping motors are discussed in the last chapters finally part 4 is devoted to the dynamics of traditional electrical machines also for the dynamics of induction and synchronous machine drives the electromagnetics are used as the starting point to derive the dynamic models throughout part 4 much attention is paid to the derivation of analytical models but of course the basic dynamic properties and probable causes of instability of induction and synchronous machine drives are discussed in detail as well with the derived models for stability in the small as starting point in addition to the study of the stability in the small a chapter is devoted to large scale dynamics as well e g sudden short circuit of synchronous machines the textbook is used as the course text for the bachelor s and master s programme in electrical and mechanical engineering at the faculty of engineering and architecture of ghent university parts 1 and 2 are taught in the basic course fundamentals of electric drives in the third bachelor part 3 is used for the course controlled electrical drives in the first master while part 4 is used in the specialised master on electrical energy

Electrical Machines - I 2002

the book is designed to cover the study of electro mechanical energy converters in all relevant aspects and also to acquaint oneself of a single treatment for all types of machines for modelling and analysis the book starts with the general concepts of energy conversion and basic circuit elements followed by a review of the mathematical tools the discussion goes on to introduce the concepts of energy storage in magnetic field electrical circuits used in rotary electro mechanical devices and three phase systems with their transformation the book further makes the reader familiar with the modern aspects of analysis of machines like transient and dynamic operation of machines asymmetrical and unbalanced operation of poly phase induction machines and finally gives a brief exposure to space phasor concepts

Principles of Electrical Machines 2006-10-20

this book covers the complete syllabi prescribed for undergraduate courses in electrical electronics mechanical and instrumentation engineering offered by various indian universities the objective of this text is to provide thorough knowledge in the emerging field of special electrical machines it discusses the stepper motor switched reluctance motor permanent magnet dc and ac motors brushless dc motors single phase special electric motors servomotors linear electric machines and permanent magnet axial flux machines key features chapter on permanent magnet axial flux machines not available in other indian authors books numerous worked out examples based on classroom tested materials simplified mathematical analysis besides undergraduate students the book will also be useful to the postgraduate students specialising in drives and control power electronics control systems and mechatronics

Electric Machines 1992

recent years have brought substantial developments in electrical drive technology with the appearance of highly rated very high speed power electronic switches combined with microcomputer control systems this popular textbook has been thoroughly revised and updated in the light of these changes it retains its successful formula of teaching through worked examples which are put in context with concise explanations of theory revision of equations and discussion of the engineering implications numerous problems are also provided with answers supplied the third edition includes enhanced coverage of power electronic systems and new material on closed loop control in addition to thorough treatment of electrical machines

Electric Machines and Drives 1983

this book presents a comprehensive exposition of the theory performance and analysis of electric machines transformers alongwith other machines including ac and dc synchronous 3 phase and single phase induction commutator special machines and solid state control have all been explained in a simple and friendly style a balance between the

mathematical and the qualitative aspects has been kept throughout the book a large variety of solved examples are included to illustrate the basic concepts and techniques unsolved problems and objective questions have also been presented at the end of each chapter the third edition also includes wide band transformers phase groups of 3 phase transformers synchronous reactor and synchronous frequency changer speed control of 3 phase induction motor operation of 3 phase induction motor with unbalanced supply voltages additional solved and unsolved problems all these features make this book an ideal text for undergraduate electrical electronics and computer engineering students upsc and amie candidates would also find the book extremely useful

Design of Electrical Machines (D.C. & A.C.) 1964

this book includes my lecture notes for electrical machines course the book is divided to different learning parts part 1 apply basic physical concepts to explain the operation and solve problems related to electrical machines part 2 explain the principles underlying the performance of three phase electrical machines part 3 analyse operate and test three phase induction machines part 4 investigate the performance design operation and testing of the three phase synchronous machine part1 apply basic physical concepts to explain the operation and solve problems related to electrical machines describe the construction of simple magnetic circuits both with and without an air gap explain the basic laws which govern the electrical machine operation such as faraday s law ampere biot savart s law and lenz s law apply faraday s law of electromagnetic induction ampere biot savart s law and lenz s law to solve for induced voltage and currents in relation to simple magnetic circuits with movable parts illustrate the principle of the electromechanical energy conversion in magnetic circuits with movable parts part 2 explain the principles underlying the performance of three phase electrical machines compare and contrast concentric and distributed windings in three phase electrical machines identify the advantages of distributed windings applied to three phase machines explain how the pulsating and rotating magnetic fields are produced in distributed windings calculate the synchronous speed of a machine based on its number of poles and frequency of the supply describe the process of torque production in multi phase machines part 3 analyse operate and test three phase induction machines calculate the slip of an induction machine given the operating and synchronous speeds calculate and compare between different torques of a three phase induction machine such as the locked rotor or starting torque pull up torque breakdown torque full load torque or braking torque develop and manipulate the equivalent circuit model for the three phase induction machine analyse and test experimentally the torque speed and current speed characteristics of induction machines and discuss the effects of varying such motor parameters as rotor resistance supply voltage and supply frequency on motor torque speed characteristics perform no load and blocked rotor tests in order to determine the equivalent circuit parameters of an induction machine explore various techniques to start an induction motor identify the applications of the three phase induction machines in industry and utility classify the insulations implemented in electrical machines windings and identify the factors affecting them part4 investigate the performance design operation and testing of the three phase synchronous machine describe the construction of three phase synchronous machines particularly the rotor stator windings and the rotor saliency develop and manipulate an equivalent circuit model for the three phase synchronous machine sketch the phasor diagram of a non salient poles synchronous machine operating at various modes operation such as no load operation motor operation and generator operation investigate the influence of the rotor saliency on machine performance perform open and short circuit tests in order to determine the equivalent circuit parameters of a synchronous machine identify the applications of the three phase synchronous machines in industry and utility list and explain the conditions of parallel operation of a group of synchronous generators evaluate the performance of the synchronous condenser and describe the power flow control between a synchronous condenser and the utility in both modes over and under excited explain the principles of controlling the output voltage and frequency of a synchronous generator

The General Theory of Electrical Machines 2007

this book presents a thorough analysis of newly available sinusoidal three phase windings in electrical machines which provide many benefits over traditional windings including energy savings noise and vibration reduction and reduced need for non ferrous metals the author s instruction on the implementation of this innovative optimization will be quite useful to researchers developers and producers of electrical machines as well as students mastering electromechanics

Matrix Analysis of Electrical Machines 2018-01-20

aims to give students of electrical engineering an awareness of basic machine concepts and some aspects of their performance control and analysis without the use of unnecessary detail

Electrical Machines and Drives 2016-05-12

in finite element analysis of electrical machines the author covers two dimensional analysis emphasizing the use of finite elements to perform the most common calculations required of machine designers and analysts the book explains what is inside a finite element program and how the finite element method can be used to determine the behavior of electrical machines the material is tutorial and includes several completely worked out examples the main illustrative examples are synchronous and induction machines the methods described have been used successfully in the design and analysis of most types of rotating and linear machines audience a valuable reference source for academic researchers practitioners and designers of electrical machinery

ELECTRICAL MACHINES : MODELLING AND ANALYSIS 2014-01-01

an ieee press classic reissue this advanced text and industry reference covers the areas of electric power and electric drives with emphasis on control applications and computer simulation using a modern approach based on reference frame theory it provides a thorough analysis of electric machines and switching converters you ll find formulations for equations of electric machines and converters as well as models of machines and converters that form the basis for predicting and understanding system level performance this text is appropriate for courses at the senior graduate level and will also be of particular interest to systems analysts and control engineers in the areas of electric power and electric drives

SPECIAL ELECTRICAL MACHINES 1973

this fully revised second edition of electrical machines is systematically organized as per the logical flow of the topics included in electrical machines courses in universities across india it is written as a text cum guide so that the underlying principles can be readily understood and is useful to both the novice as well as advanced readers emphasis has been laid on physical understanding and pedagogical aspects of the subject in addition to conventional machines the book s extensive coverage also includes rigorous treatment of transformers current potential and welding transformers special machines ac dc servomotors linear induction motors permanent magnet dc motors and application of thyristors in rotating machines

Control of Electric Machines 1996-09-19

the basic theory principle of operation and characteristics of transformers three phase induction motors single phase induction motors synchronous machines and dc machines are dealt with in appendices to provide the background for the design of these machines

Electrical Machines and Drives 2005

Fundamentals of Electric Machines 2020-04-01

Electrical Machines 1979

General Theory of Electrical Machines 2016-09-23

Sinusoidal Three-Phase Windings of Electric Machines 1991

Performance and Control of Electrical Machines 2012-12-06

Finite Element Analysis of Electrical Machines 1968

The Unified Theory of Electrical Machines 1995

Analysis of Electric Machinery 2012

Electrical Machines 1978

Electrical Machines 2010

Design and Testing of Electrical Machines 1968

The Performance of Electrical Machines

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