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# Electrical Machines S Rao

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Electric Machines

Electrical Machines - Ii

Electrical Machines

Handbook of Electric Machines

Analysis of Electrical Machines

Testing Commissioning Operation and  
Maintenance of Electrical Equipments (Questions  
and Answers on Useful Practical Aspects)

Electrical Machines - II

Electrical Machines 1

Matrix Analysis of Electrical Machines

Engineering Mechanics

SPECIAL ELECTRICAL MACHINES

A Textbook Of Electrical Machines

Electrical Machines

ELECTRICAL MACHINES

Emerging Electric Machines

Testing, Commissioning, Operation and  
Maintenance of Electrical Equipment

Testing Commissioning Operation & Maintenance  
Of Electrical Equipments

Fundamentals of Electric Machines

Design of Electrical Machines

A Text Book of Electrical Machines

Electrical Machines

Electrical Machines

Electrical Machines

Electrical Machines: Analysis and Applications  
ELECTRICAL MACHINES : MODELLING AND  
ANALYSIS

Electrical Machines

Control Of Electrical Machines

Laboratory Manual for Electrical Machines, 2/e

Design and Testing of Electrical Machines

Electrical Machines

Matrix Analysis of Electrical Machinery

Electrical Machines

Electrical Machines

Electrical Machines

Electrical Machines

Electrical machines

Electrical Machines and Control (For UPTU,  
Lucknow)

Electrical Machines - I

ELECTRICAL MACHINES

Advancements in Electric Machines

*Electrical  
Machines S  
Rao*

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**LIVIA LILLY**

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*Electric Machines* New  
Age International

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.

*Electrical Machines - II*  
BoD – Books on Demand

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**

Pearson Education

India

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. *Handbook of Electric Machines* Prentice Hall An electrical machine is a device that converts mechanical energy into electrical

energy or vice versa. Major types of electrical machines are generators, motors and transformers. An electric generator is a type of electrical machine that works on the principle of electromagnetic induction. It consists of two main components which are a stator and a rotor. Generators can be classified as AC generators and DC generators. The electric motor converts electrical energy into mechanical energy. It can be classified into AC motors and DC motors. The transformer is a static electrical device that transfers electric power from one circuit to another circuit. Some major applications of electric devices are electric vehicles and battery-

powered devices such as wheelchairs, power tools, guided vehicles, welding equipment, X-ray and tomographic systems, and computer numerical control (CNC) machines. This book presents the analysis and applications of electrical machines. Students, researchers, experts and all associated with the field of electrical engineering will benefit from it.

*Analysis of Electrical Machines* PHI Learning Pvt. Ltd.

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.

Testing Commissioning Operation and Maintenance of Electrical Equipments (Questions and Answers on Useful Practical Aspects)

Clanrye International Laboratory Manual for Electrical Machines (2nd) edition includes four new experiments in electrical machines so that it can cater to the complete syllabus of undergraduate laboratory courses of

electrical machines. This book gives the basic information to the students with the machine phenomenon, working principles and testing methods, etc. It also imparts real physical understanding of various types of electrical machines. The main attraction of this laboratory manual is its power point presentation for all experiments. This manual is meant for electrical engineering students of B.E. and B.Tech and polytechnics.

**Electrical Machines - II** Pearson Education India

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.

*Electrical Machines 1*  
McGraw-Hill Companies  
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.

*Matrix Analysis of Electrical Machines* PHI Learning Pvt. Ltd.

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.

*Engineering Mechanics* Technical Publications

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.

***SPECIAL ELECTRICAL MACHINES*** Dr. Hidaia

Mahmood Alassouli

Electrical Machines is a book which takes the theoretical and mathematical concepts of the most commonly used electrical machines in the industry and home appliances and presents the practical working and operation easily understandable to the readers. It provides a different approach from other books, by providing a step by step procedure on how to start and run the machine on various load conditions, operating conditions and also various

testing conditions and connections along with a complete set of readings, calculations and graphs/plots performed on standard electrical machines with rated voltage and current. In addition to this, all questions related to each machine and testing condition/operation along with solved numerical problems and also exercise problems for practice.

*A Textbook Of Electrical Machines*  
CRC Press

This book covers all the topics essential for a first course in Engineering Mechanics. Written keeping in mind the needs of undergraduate engineering students and those appearing for competitive examinations, it covers

the theoretical concepts and operations solid mechanics in a lucid and well-illustrated manner.

### **Electrical Machines**

Elsevier

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

Universities Press

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. The initial chapters of the book are devoted to basic parameters of design of electrical apparatus, characteristics of magnetic, electric and insulating materials, construction of electrical machines, and basic design requirements of magnetic and electrical circuits of machines. Detailed procedures for designing transformers, three-phase induction motors, single-phase induction motors, synchronous machines and dc machines are explained in a simple and logical way. Several sample designs have been worked out

in detail. Methods of carrying out various tests and maintaining test records are discussed in detail. The use of computers in designing electrical machines has been illustrated. An exclusive chapter on special machines explains the basic theory and applications of stepper motors, rotating phase converters, pole amplitude modulated (PAM) motors, reluctance motors and energy efficient motors. This book is intended for degree and diploma students of electrical engineering and professional examinations of the Institution of Engineers (India). It will be useful for electrical engineers in industry engaged in design, manufacture

and testing of electrical machines.

Emerging Electric Machines Elsevier

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.

**Testing, Commissioning, Operation and Maintenance of Electrical Equipment**

New Age International  
 Single Phase Transformer | Three Phase Transformer And Autotransfer | Dc Motor | Three Phase Induction Motor And Servomotor | Alternator | Synchronous Motor | Introduction To Control System | Signals And Transfer Function | Modeling Of Mechanical System | Time Response Analysis | Stability | Polar Plot | Frequency Response Analysis |

Root Locus Techniques | Process Control | University Question Papers

Testing Commissioning Operation & Maintenance Of Electrical Equipments

de Gruyter

This is a single-volume book on 'electrical machines' that teaches the subject precisely and yet with amazing clarity. The extent has been kept in control so that the entire subject can be covered by students within the limited time of the semesters. Thus, they will not have to consult multiple books anymore. The discussions of concepts include the modern trends used in industry, like efficient transformers, efficient induction motors, DC drives, and the problems related to

them.

Fundamentals of Electric Machines New Age International  
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 Electrical Machines Springer Science & Business Media

This comprehensive textbook covers the syllabus of electrical machines of almost all the Indian universities. The language of the book is simple and easy to understand and each topic is well illustrated by examples and figures. The book can be used by the students for self-teaching. It deals in

electromagnetism and discusses the electromechanical energy conversion principles. The text explains the principles and working of transformers, synchronous machines and three-phase induction motors. The book also deals with other special types of machines including single phase induction motor. This book is primarily intended for undergraduate students of electrical engineering. Key Features • Contains a large number of solved problems and review questions in each chapter. • Supplements a large number of multiple choice questions and numerical problems with their answers in each chapter. • Provides an elaborate

and systematic analysis of working principle, application and construction of each electrical machine.

A Text Book of Electrical Machines

New Age International

This textbook offers insights into the principles and applications of electrical machines. The text provides a thorough understanding of the fundamentals that are common to all machines. The book elaborates on single-phase and three-phase transformers, DC machines, AC machines as well as commutator motors, and three-phase induction motors, single-phase induction motors, synchronous machines, generators and motors. This book

is intended as a text for students pursuing diploma and undergraduate courses in Electrical Engineering in various universities and engineering institutes. Besides, the book takes care of the requirements of students who are preparing for professional examinations, including those

conducted by the Institution of Engineers (India), i.e. AMIE. KEY FEATURES: Discusses the step-by-step coverage of the construction of electrical machines. Gives the methods of testing of electrical machines. Provides the performance calculations of electrical machines. Includes numerous worked-out examples.

Best Sellers - Books :

- [Icebreaker: A Novel \(the Maple Hills Series\)](#)
- [Daisy Jones & The Six: A Novel By Taylor Jenkins Reid](#)
- [You Will Own Nothing: Your War With A New Financial World Order And How To Fight Back By Carol Roth](#)
- [Daisy Jones & The Six: A Novel](#)
- [The Boy, The Mole, The Fox And The Horse By Charlie Mackesy](#)
- [Tomorrow, And Tomorrow, And Tomorrow: A Novel](#)
- [Jackie: Public, Private, Secret By J. Randy Taraborrelli](#)
- [I Love You Like No Otter: A Funny And Sweet](#)

Board Book For Babies And Toddlers (punderland)

By Rose Rossner

- The Wager: A Tale Of Shipwreck, Mutiny And Murder
- Hello Beautiful (oprah's Book Club): A Novel