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# Electrical Drives And Control Laboratory Viva Questions

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Electric Machines and Drives  
Electric Drives and Electromechanical Systems  
Fundamentals of Electrical Drives  
Advances in Automatic Control  
Model Predictive Control of High Power Converters and Industrial Drives  
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Electrical Drives and Control for Automation

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## **LILIAN GROSS**

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### Electric Machines and Drives Elsevier

This book presents the latest cutting-edge technology in high-power converters and medium voltage drives, and provides a complete analysis of various converter topologies, modulation techniques, practical drive configurations, and advanced control schemes. Supplemented with more than 250 illustrations, the author illustrates key concepts with simulations and experiments. Practical problems, along with accompanying solutions, are presented to help you tackle real-world issues.

### Electric Drives and Electromechanical Systems John Wiley & Sons

Suitable for undergraduate and postgraduate courses in electrical drives, this book covers topics on: Dynamics and control of electrical drives; Selection of motor power rating; DC, induction and synchronous motor drives; Stepper motor and switched reluctance motor drives; Permanent magnet ac and brushless dc motor drives; and more.

### Fundamentals of Electrical Drives New Age International

Electrical drives play an important role as electromechanical energy converters in transportation, material handling and most production processes. The ease of controlling electrical drives is an important aspect for meeting the increasing demands by the user with respect to flexibility and precision, caused by technological progress in industry as well as the need for energy conservation. At the same time, the control of electrical drives has provided strong incentives to control engineering in general, leading to the development of new control structures and their introduction to other areas of control. This is due to the stringent operating conditions and widely varying specifications - a drive may alternately require control of torque, acceleration, speed or position - and the fact that most electric drives have - in contrast to chemical or thermal processes - well defined structures and consistent dynamic characteristics. During the last years the field of controlled electrical drives has undergone rapid expansion due mainly to the advances of semiconductors in the form of power electronics as well as analogue and digital signal electronics, eventually culminating in microelectronics and microprocessors. The introduction of electronically switched solid-state power converters has renewed the search for adjustable speed AC motor drives, not subject to the limitations of the mechanical commutator of DC drives which dominated the field for a century.

### Advances in Automatic Control John Wiley & Sons

Provides broad insights into problems of coding control algorithms on a DSP platform. - Includes a set of Simulink simulation files (source codes) which permits readers to envisage the effects of control solutions on the overall motion control system. -bridges the gap between control analysis and industrial practice.

### Model Predictive Control of High Power Converters and Industrial Drives Oxford University Press, USA

A guide to drives essential to electric vehicles, wind turbines, and other motor-driven systems  
Analysis and Control of Electric Drives is a practical and comprehensive text that offers a clear

understanding of electric drives and their industrial applications in the real-world including electric vehicles and wind turbines. The authors—noted experts on the topic—review the basic knowledge needed to understand electric drives and include the pertinent material that examines DC and AC machines in steady state using a unique physics-based approach. The book also analyzes electric machine operation under dynamic conditions, assisted by Space Vectors. The book is filled with illustrative examples and includes information on electric machines with Interior Permanent Magnets. To enhance learning, the book contains end-of-chapter problems and all topics covered use computer simulations with MATLAB Simulink® and Sciambi® Workbench software that is available free online for educational purposes. This important book: Explores additional topics such as electric machines with Interior Permanent Magnets Includes multiple examples and end-of-chapter homework problems Provides simulations made using MATLAB Simulink® and Sciambi® Workbench, free software for educational purposes Contains helpful presentation slides and Solutions Manual for Instructors; simulation files are available on the associated website for easy implementation A unique feature of this book is that the simulations in Sciambi® Workbench software can seamlessly be used to control experiments in a hardware laboratory Written for undergraduate and graduate students, Analysis and Control of Electric Drives is an essential guide to understanding electric vehicles, wind turbines, and increased efficiency of motor-driven systems.

### Electric Drives Springer

This work explains how to size, select and implement an industrial drive system. The author offers a practical but structured approach which places particular emphasis on smaller drive systems. Examples are given from the machine tool and robotics industries.

### Sliding Mode Control for Synchronous Electric Drives CRC Press

Linear motion is richly present in various industries, from direct electric propulsion in urban and interurban people movers on wheels or on magnetic “cushions” (MAGLEVs) to indoor transport of goods (conveyors, etc.), through plunger solenoids (to open hotel doors and as electromagnetic power switches), to compressor drives by linear oscillatory permanent magnet (PM) motors, smart phones integrated microphone and loudspeakers, and controlled vehicles’ suspension, etc. Besides the traditional rotary motor drives with mechanical transmissions, which mean friction limitations (weather dependent) in traction (heavy vehicles), more losses, positioning errors (backlash) in the process, and higher maintenance costs to handle them, linear motion in industry by direct electromagnetic forces is free of friction limitations for traction, free of mechanical transmission, and thus more efficient, with less maintenance cost and fewer positioning errors (backlash). This explains why they are used in so many applications already since the dramatic advancement of power electronics and digital control in the last four decades. Modeling, performance, design, control, and testing of linear electric machines (LEMs) show notable differences with respect to rotary electric motor drives, which warrant a dedicated treatment of these aspects. The Second Edition (First Edition: 2013) concentrates on the above technical aspects of various types of LEMs in close relationship with specific applications via numerical examples of modeling, design, control, and testing, with ample representative results from literature, industry and some of the author’s

contributions, such as: Technical field and circuit modeling of linear induction motors in flat configurations for low and high speeds (with and without dynamic end effects) and in tubular configurations short travel design, control and testing Linear synchronous motor (LSM) drives in dc-excited, homopolar, reluctance and superconducting excitation configurations for urban and interurban high-speed vehicles propulsion and integrated propulsion and levitation (in MAGLEVs) modeling, design and control with full-scale numerical examples, with emphasis on lower KWh/passenger/Km at high speeds Flat and tubular linear permanent magnet (PM) synchronous motors (L-PMSMs), mainly destined to industrial indoor transport for automation at high efficiency in clean rooms Linear "flux-modulation" motors— new breed, suitable for very low-speed applications due to higher thrust density Plunger solenoids in various applications including new valve PM actuators with millisecond response time Linear resonant PM oscillatory motors design, control and testing mainly destined to compressors for higher efficiency in compact drives Attraction and repulsive force suspension (levitation) systems for MAGLEVs Active and passive guideway MAGLEVs in urban and superhigh-speed interurban transport at lower Kwh per passenger/km (in lighter vehicles without wheels) The numerous numerical design and control examples (with practical specifications) throughout the 23 chapters of the book allow the reader deep and fast access to a practical but thorough unitary (good for comparisons) methodology in designing and controlling LEMs for various applications.

Experiments for Electrical Machines, Drives, and Power Systems Springer Science & Business Media  
The book *New Approaches in Automation and Robotics* offers in 22 chapters a collection of recent developments in automation, robotics as well as control theory. It is dedicated to researchers in science and industry, students, and practicing engineers, who wish to update and enhance their knowledge on modern methods and innovative applications. The authors and editor of this book wish to motivate people, especially under-graduate students, to get involved with the interesting field of robotics and mechatronics. We hope that the ideas and concepts presented in this book are useful for your own work and could contribute to problem solving in similar applications as well. It is clear, however, that the wide area of automation and robotics can only be highlighted at several spots but not completely covered by a single book.

*Electric Machines and Electric Drives* John Wiley & Sons

"This book presents current developments in the multidisciplinary creation of Internet accessible remote laboratories, offering perspectives on teaching with online laboratories, pedagogical design, system architectures for remote laboratories, future trends, and policy issues in the use of remote laboratories"--Provided by publisher.

**Permanent Magnet Synchronous Machines and Drives** CRC Press

Thanks to advances in power electronics device design, digital signal processing technologies and energy efficient algorithms, ac motors have become the backbone of the power electronics industry. Variable frequency drives (VFD's) together with IE3 and IE4 induction motors, permanent magnet motors, and synchronous reluctance motors have emerged as a new generation of greener high-performance technologies, which offer improvements to process and speed control, product quality, energy consumption and diagnostics analytics. Primarily intended for professionals and advanced students who are working on sensorless control, predictive control, direct torque control, speed

control and power quality and optimisation techniques for electric drives, this edited book surveys state of the art novel control techniques for different types of ac machines. The book provides a framework of different modeling and control algorithms using MATLAB®/Simulink®, and presents design, simulation and experimental verification techniques for the design of lower cost and more reliable and performant systems.

**Intelligent Learning Systems and Advancements in Computer-Aided Instruction: Emerging Studies** Stephen P Tubbs

"This book reviews computational models and technologies for distance education, focusing on systems, infrastructures, and frameworks for delivering quality education"--Provided by publisher.  
*Digital Control of Electrical Drives* Springer Science & Business Media

This comprehensive text examines existing and emerging electrical drive technologies. The authors clearly define the most basic electrical drive concepts and go on to explain the most important details while maintaining a solid connection to the theory and design of the associated electrical machines. Also including links to a number of industrial applications, the authors take their investigation of electrical drives beyond theory to examine a number of practical aspects of electrical drive control and application. Key features: \* Provides a comprehensive summary of all aspects of controlled-speed electrical drive technology including control and operation. \* Handling of electrical drives is solidly linked to the theory and design of the associated electrical machines. Added insight into problems and functions are illustrated with clearly understandable figures. \* Offers an understanding of the main phenomena associated with electrical machine drives. \* Considers the problem of bearing currents and voltage stresses of an electrical drive. \* Includes up-to-date theory and design guidelines, taking into account the most recent advances. This book's rigorous coverage of theoretical principles and techniques makes for an excellent introduction to controlled-speed electrical drive technologies for Electrical Engineering MSc or PhD students studying electrical drives. It also serves as an excellent reference for practicing electrical engineers looking to carry out design, analyses, and development of controlled-speed electrical drives.

*Internet Accessible Remote Laboratories: Scalable E-Learning Tools for Engineering and Science Disciplines* Springer

"This book offers a collection of the latest research, trends, future developments, and case studies pertaining to collaborative learning"--Provided by publisher.

Control in Power Electronics and Electrical Drives PHI Learning Pvt. Ltd.

· Provides an overall understanding of all aspects of AC electrical drives, from the motor and converter to the implemented control algorithm, with minimum mathematics needed · Demonstrates how to implement and debug electrical drive systems using a set of dedicated hardware platforms, motor setup and software tools in VisSim™ and PLECS™ · No expert programming skills required, allowing the reader to concentrate on drive development · Enables the reader to undertake real-time control of a safe (low voltage) and low cost experimental drive This book puts the fundamental and advanced concepts behind electric drives into practice. Avoiding involved mathematics whenever practical, this book shows the reader how to implement a range of modern day electrical drive concepts, without requiring in depth programming skills. It allows the user to build and run a series of AC drive concepts, ranging from very basic drives to sophisticated sensorless drives. Hence the

book is the only modern resource available that bridges the gap between simulation and the actual experimental environment. Engineers who need to implement an electrical drive, or transition from sensorless to sensorless drives, as well as students who need to understand the practical aspects of working with electrical drives, will greatly benefit from this unique reference.

**Advanced Control of Electrical Drives and Power Electronic Converters** IGI Global

This contributed volume is written by key specialists working in multidisciplinary fields in electrical engineering, linking control theory, power electronics, artificial neural networks, embedded controllers and signal processing. The authors of each chapter report the state of the art of the various topics addressed and present results of their own research, laboratory experiments and successful applications. The presented solutions concentrate on three main areas of interest: · motion control in complex electromechanical systems, including sensorless control; · fault diagnosis and fault tolerant control of electric drives; · new control algorithms for power electronics converters. The chapters and the complete book possess strong monograph attributes. Important practical and theoretical problems are deeply and accurately presented on the background of an exhaustive state-of the art review. Many results are completely new and were never published before. Well-known control methods like field oriented control (FOC) or direct torque control (DTC) are referred as a starting point for modifications or are used for comparison. Among numerous control theories used to solve particular problems are: nonlinear control, robust control, adaptive control, Lyapunov techniques, observer design, model predictive control, neural control, sliding mode control, signal filtration and processing, fault diagnosis, and fault tolerant control.

*Modeling, Simulation and Control of Electrical Drives* Prentice Hall Professional

Electrical drives convert electrical energy into mechanical energy and act as a intermediary between electrical supply systems, various energy sources, driven machines and the energy consumer. Electrical drives are major component in industrial applications, driven technical developments and focus of various developments. The core component of every electrical drive is the motor. This book is divided into six modules. Module 1 deals with DC machines, principles of operation, emf equation and armature reaction. Module 2 contain principles of DC motors and their torque-speed

characteristics. Module 3 mainly deals with transformers and their efficiency calculations. In module 4, various aspects of induction motors were covered. Module 5 and 6 mainly focusses on split phase and stepper motors. Today electrical drives and their automation has become an essential integral part of every system and process. This book will focus primarily on electrical drives and their control for automation, although some of the topics covered will remain applicable to process control.

Modern Electrical Drives Springer

Electrical drives play an important part as electromechanical energy converters in transportation, materials handling and most production processes. This book presents a unified treatment of complete electrical drive systems, including the mechanical parts, electrical machines, and power converters and control. Since it was first published in 1985 the book has found its way onto many desks in industry and universities all over the world. For the second edition the text has been thoroughly revised and updated, with the aim of offering the reader a general view of the field of controlled electrical drives, which are maintaining and extending their importance as the most flexible source of controlled mechanical energy.

**Control of Electrical Drives** Springer Nature

The purpose of this book is to familiarize the reader with all aspects of electrical drives. It contains a comprehensive user-friendly introductory text.

A First Course on Electrical Drives CRC Press

This book provides a comprehensive introduction to the fundamental concepts of electric drives and is eminently suited as a textbook for B.E./B.Tech., AMIE and diploma courses in electrical engineering. It can also be used most effectively by all those preparing for GATE and UPSC competitive examinations, as well as by practising engineers. The topics, which range from principles and techniques to industrial applications, include characteristic features of drives, methods of braking and speed control, electromagnetic and solid state control of motors, motor ratings, transients in drive systems, and operation of stepper motors.

**Linear Electric Machines, Drives, and MAGLEVs Handbook** Alpha Science Int'l Ltd.

Analysis and Control of Electric Drives John Wiley & Sons

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