

Digital Logic Circuits

Atul P. Godse, Dr. Deepali A. Godse

Digital Logic Circuits:

Digital Logic Circuits Dr. P. Kannan, Mrs. M. Saraswathi, Mr. C. Rameshkumar, PREFACE OF THE BOOK This book is extensively designed for the third semester EEE EIE students as per Anna university syllabus R 2013 The following chapters constitute the following units Chapter 1 9 covers Unit 1Chapter 2 and 3 covers Unit 2Chapter 4 and 5 covers Unit 3Chapter 6 and 7 covers Unit 4Chapter 8 VHDL Unit 5 CHAPTER 1 Introduces the Number System binary arithmetic and codes CHAPTER 2 Deals with Boolean algebra simplification using Boolean theorems K map method Quine McCluskey method logic gates implementation of switching function using basic Logical Gates and Universal Gates CHAPTER 3 Describes the combinational circuits like Adder Subtractor Multiplier Divider magnitude comparator encoder decoder code converters Multiplexer and Demultiplexer CHAPTER 4 Describes with Latches Flip Flops Registers and Counters CHAPTER 5 Concentrates on the Analysis as well as design of synchronous sequential circuits Design of synchronous counters sequence generator and Sequence detector CHAPTER 6 Concentrates the Design as well as Analysis of Fundamental Mode circuits Pulse mode Circuits Hazard Free Circuits ASM Chart and Design of Asynchronous counters CHAPTER 7 Discussion on memory devices which includes ROM RAM PLA PAL Sequential logic devices and ASIC CHAPTER 8 The chapter concentrates on the design fundamental building blocks Data types operates subprograms packagaes compilation process used for VHDL It discusses on Finite state machine as an important tool for designing logic level state machines The chapter also discusses register transform level designing and test benches usage in stimulation of the state logic machines CHAPTER 9 Concentrate on the comparison operation and characteristics of RTL DTL TTL ECL and MOS families We have taken enough care to present the definitions and statements of basic laws and theorems problems with simple steps to make the students familiar with the fundamentals of Digital Design Practical Design of Digital Circuits Ian Kampel, 2015-08-11 Practical Design of Digital Circuits Basic Logic to Microprocessors demonstrates the practical aspects of digital circuit design The intention is to give the reader sufficient confidence to embark upon his own design projects utilizing digital integrated circuits as soon as possible The book is organized into three parts Part 1 teaches the basic principles of practical design and introduces the designer to his tools or rather the range of devices that can be called upon Part 2 shows the designer how to put these together into viable designs It includes two detailed descriptions of actual design exercises The first of these is a fairly simple exercise in CMOS design the second is a much more complex design for an electronic game using TTL devices Part 3 focuses on microprocessors It illustrates how a particular design problem changes emphasis when a microprocessor is introduced This book is aimed at a fairly broad market it is intended to aid the linear design engineer to cross the barrier into digital electronics it should provide interesting supporting reading for students studying digital electronics from the more academic viewpoint and it should enable the enthusiast to design much more ambitious and sophisticated projects than he could otherwise attempt if restricted to linear devices **Digital Electronics 1** Tertulien Ndjountche, 2016-06-20 The

omnipresence of electronic devices in our everyday lives has been accompanied by the downscaling of chip feature sizes and the ever increasing complexity of digital circuits This book is devoted to the analysis and design of digital circuits where the signal can assume only two possible logic levels It deals with the basic principles and concepts of digital electronics It addresses all aspects of combinational logic and provides a detailed understanding of logic gates that are the basic components in the implementation of circuits used to perform functions and operations of Boolean algebra Combinational logic circuits are characterized by outputs that depend only on the actual input values Efficient techniques to derive logic equations are proposed together with methods of analysis and synthesis of combinational logic circuits Each chapter is well structured and is supplemented by a selection of solved exercises covering logic design practices Digital Logic Design Brian Holdsworth, Clive Woods, 2002-11-01 New updated and expanded topics in the fourth edition include EBCDIC Grey code practical applications of flip flops linear and shaft encoders memory elements and FPGAs The section on fault finding has been expanded A new chapter is dedicated to the interface between digital components and analog voltages A highly accessible comprehensive and fully up to date digital systems text A well known and respected text now revamped for current courses Part of the Newnes suite of texts for HND 1st year modules A Systematic Approach to Digital Logic **Design** Frederic J. Mowle,1976 Number systems Base R arithmetic Boolean algebra Special boolean functions and basic logic conventions Minimization procedures for boolean function Binary arithmetic units Decimal arithmetic Introduction to sequential circuit design Practical flip flop circuits Binary counters Register design techniques Advanced arithmetic units

Fundamentals and Applications of Digital Logic Circuits Sol Libes, 1975 DIGITAL LOGIC DESIGN Sonali Singh, 2018-06-01 Description The book is an attempt to make Digital Logic Design easy and simple to understand The book covers various features of Logic Design using lots of examples and relevant diagrams. The complete text is reviewed for its correctness This book is an outcome of sincere effort and hard work to bring concepts of Digital Logic Design close to the audience of this book The salient features of the book Easy explanation of Digital System and Binary Numbers with lots of solved examples Detailed covering of Boolean Algebra and Gate Level Minimization with proper examples and diagrammatic representation Detailed analysis of different Combinational Logic Circuits Complete Synchronous sequential Logic understanding Deep understanding of Memory and Programmable Logic Detailed analysis of different Asynchronous Sequential LogicTable Of Contents Unit 1 Digital System and Binary Numbers Part 1 Digital System and Binary NumbersPart 2 Boolean Algebra and Gate Level MinimizationUnit 2 Combinational LogicUnit 3 Sequential CircuitsUnit 4 Memory Programmable Logic and DesignUnit 5 Asynchronous Sequential Logic Digital Electronic Circuits - The Comprehensive View Alexander Axelevitch, 2018-09-25 This book deals with key aspects of design of digital electronic circuits for different families of elementary electronic devices Implementation of both simple and complex logic circuits are considered in detail with special attention paid to the design of digital systems based on complementary metal oxide semiconductor CMOS and

Pass Transistor Logic PTL technologies acceptable for use in planar microelectronics technology It is written for students in electronics and microelectronics with exercises and solutions provided Related Link's <u>Digital Logic Circuits</u> Mr. Rohit Manglik, 2024-03-02 EduGorilla Publication is a trusted name in the education sector committed to empowering learners with high quality study materials and resources Specializing in competitive exams and academic support EduGorilla provides comprehensive and well structured content tailored to meet the needs of students across various streams and levels Definitive Guide to Logic Circuits and Advanced Circuits Mastering Digital Electronics, 2024-01-18 Introduction The Aims and Objectives of the Book My main aim in writing this book is to introduce you to the exciting and challenging field of digital electronics I want to develop your desire and ability to understand how digital circuits work After reading this book you should be able to do some or all of the following You will understand what TTL and CMOS mean and appreciate their main differences You should know what the five main logic gates are and their respective symbols and Boolean expressions You should know the basics of Boolean algebra and use it to simplify logic expressions and circuits You should know what Karnaugh maps are and how to use them to simplify logic circuits and expressions You should know how to implement the 1st and 2nd canonical formats for Karnaugh maps You will know how the JK flip flop works and how it was born out of the SR latch You should be able to use the JK flip flop and the D type latch to create a series of counters and different shift registers such as SIPO SISO PIPO and PISO You should understand the difference between sequential and combinational logic You should be able to use a range of design techniques that is state diagrams transition tables etc You should be able to create a range of combinational logic circuits such as half and full adders binary subtractors multiplexers etc You should understand how the 555 timer IC works and how to configure it in a range of different applications such as the monostable the astable and PWM You should be able to design a range of logic circuits You should be able to use the ECAD software TINA 12

Foundations of Digital Logic Design Gideon Langholz, Abraham Kandel, Joe L. Mott, 1998 This text is intended for a first course in digital logic design at the sophomore or junior level for electrical engineering computer engineering and computer science programs as well as for a number of other disciplines such as physics and mathematics. The book can also be used for self study or for review by practicing engineers and computer scientists not intimately familiar with the subject. After completing this text the student should be prepared for a second advanced course in digital design switching and automata theory microprocessors or computer organization. Digital Circuits Ronald C. Emery, 2020-11-25 This textbook is intended to introduce the student of electronics to the fundamentals of digital circuits both combinational and sequential in a reasonable and systematic manner. It proceeds from basic logic concepts to circuits and designs. Digital Logic Circuits using VHDL. Atul P. Godse, Dr. Deepali A. Godse, 2021-01-01. The book is written for an undergraduate course on digital electronics. The book provides basic concepts procedures and several relevant examples to help the readers to understand the analysis and design of various digital circuits. It also introduces hardware description language VHDL. The book teaches

you the logic gates logic families Boolean algebra simplification of logic functions analysis and design of combinational circuits using SSI and MSI circuits and analysis and design of the sequential circuits This book provides in depth information about multiplexers de multiplexers decoders encoders circuits for arithmetic operations various types of flip flops counters and registers It also covers asynchronous sequential circuits memories and programmable logic devices Circuits Atul P. Godse, 2007 **Digital Electronics** John D. Kershaw, 1976 Digital Logic Techniques, 3rd Edition John Stonham, 1996-05-19 The third edition of Digital Logic Techniques provides a clear and comprehensive treatment of the representation of data operations on data combinational logic design sequential logic computer architecture and practical digital circuits A wealth of exercises and worked examples in each chapter give students valuable experience in applying the concepts and techniques discussed Beginning with an objective comparison between analogue and digital representation of data the author presents the Boolean algebra framework for digital electronics develops combinational logic design from first principles and presents cellular logic as an alternative structure more relevant than canonical forms to VLSI implementation He then addresses sequential logic design and develops a strategy for designing finite state machines giving students a solid foundation for more advanced studies in automata theory The second half of the book focuses on the digital system as an entity Here the author examines the implementation of logic systems in programmable hardware outlines the specification of a system explores arithmetic processors and elucidates fault diagnosis. The final chapter examines the electrical properties of logic components compares the different logic families and highlights the problems that can arise in constructing practical **Beginning Digital Electronics Through Projects** Andrew Singmin, 2001-01-10 This text through hardware systems digital experiments aims to teach the reader practical electronics circuit theory and building techniques Step by step instructions are used to teach techniques for component identification soldering and troubleshooting Digital Logic Design Guy Even, Moti Medina, 2012-10-08 This textbook based on the authors fifteen years of teaching is a complete teaching tool for turning students into logic designers in one semester Each chapter describes new concepts giving extensive applications and examples Assuming no prior knowledge of discrete mathematics the authors introduce all background in propositional logic asymptotics graphs hardware and electronics Important features of the presentation are All material is presented in full detail Every designed circuit is formally specified and implemented the correctness of the implementation is proved and the cost and delay are analyzed Algorithmic solutions are offered for logical simulation computation of propagation delay and minimum clock period Connections are drawn from the physical analog world to the digital abstraction The language of graphs is used to describe formulas and circuits Hundreds of figures examples and exercises enhance understanding The extensive website http www eng tau ac il guy Even Medina includes teaching slides links to Logisim and a DLX assembly simulator Digital Logic Circuit Analysis and Design Victor Peter Nelson, 1995 For introductory digital logic design or computer engineering courses in electrical and computer engineering or computer science at the sophomore or junior level

Many recent texts place instructors in the difficult position of choosing between authoritative state of the art coverage and an approach that is highly supportive of student learning This carefully developed text was widely praised by reviewers for both its great clarity and its rigor The book balances theory and practice in depth without getting bogged down in excessive technical or mathematical language and has abundant coverage of current topics of interest such as programmable devices computer aided design and testability An unusually large number of illustrations examples and problems help students gain a solid sense of how theory underlies practice

Digital Electronics: A Primer - Introductory Logic Circuit Design Mark S Nixon, 2015-01-27 This practical introduction explains exactly how digital circuits are designed from the basic circuit to the advanced system It covers combinational logic circuits which collect logic signals to sequential logic circuits which embody time and memory to progress through sequences of states The primer also highlights digital arithmetic and the integrated circuits that implement the logic functions Based on the author's extensive experience in teaching digital electronics to undergraduates the book translates theory directly into practice and presents the essential information in a compact digestible style Worked problems and examples are accompanied by abbreviated solutions with demonstrations to ensure that the design material and the circuits operation are fully understood This is essential reading for any electronic or electrical engineering student new to digital electronics and requiring a succinct yet comprehensive introduction

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Table of Contents Digital Logic Circuits

- 1. Understanding the eBook Digital Logic Circuits
 - The Rise of Digital Reading Digital Logic Circuits
 - Advantages of eBooks Over Traditional Books
- 2. Identifying Digital Logic Circuits
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Digital Logic Circuits
 - User-Friendly Interface
- 4. Exploring eBook Recommendations from Digital Logic Circuits
 - Personalized Recommendations
 - o Digital Logic Circuits User Reviews and Ratings
 - o Digital Logic Circuits and Bestseller Lists
- 5. Accessing Digital Logic Circuits Free and Paid eBooks
 - Digital Logic Circuits Public Domain eBooks
 - Digital Logic Circuits eBook Subscription Services
 - Digital Logic Circuits Budget-Friendly Options

- 6. Navigating Digital Logic Circuits eBook Formats
 - o ePub, PDF, MOBI, and More
 - Digital Logic Circuits Compatibility with Devices
 - o Digital Logic Circuits Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Digital Logic Circuits
 - Highlighting and Note-Taking Digital Logic Circuits
 - Interactive Elements Digital Logic Circuits
- 8. Staying Engaged with Digital Logic Circuits
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Digital Logic Circuits
- 9. Balancing eBooks and Physical Books Digital Logic Circuits
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Digital Logic Circuits
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Digital Logic Circuits
 - Setting Reading Goals Digital Logic Circuits
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Digital Logic Circuits
 - Fact-Checking eBook Content of Digital Logic Circuits
 - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements

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