Digital Electronics: A Practical Approach, 8/E

William Kleitz
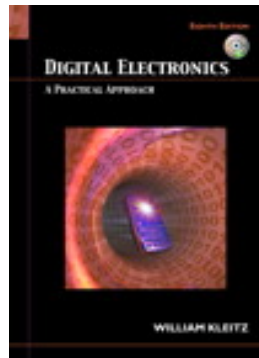Publisher: Prentice Hall
Copyright: 2008
Format: Cloth; 944 pp
ISBN-10: 0132435780
ISBN-13: 9780132435789

Book Description

Designed to be an easy-to-learn-from resource it emphasizes practical application of circuit design, operation, and troubleshooting and offers over 1,000 annotated figures to explain circuit operation or emphasize critical components and input/output criteria. This edition features updated information on surface-mount devices, expanded coverage of encoders, decoders, and multiplexers and new troubleshooting examples.

Features

- Complex Programmable Logic Devices (CPLDs) — Integrated within most chapters as a modern alternative to 7400-Series ICs.
- Electronics Workbench/MultiSIM examples and troubleshooting problems — Provide computer simulation of design and troubleshooting of digital circuits.
- Schematic interpretation problems — Gives students experience interpreting real-world circuits and ICs in complete system schematic diagrams.
- Timing waveforms — Gives students experience interpreting the waveforms they will encounter on the job when using oscilloscopes and logic analyzers.
- Circuit operational notes — Clarifies illustrations to provide students a quick insight into circuit operation.
- Design and troubleshooting problems — Asks students to modify existing circuits, as well as diagnose circuits for proper operation.
- Margin annotations — Point out common misconceptions, team discussions, and helpful hints.
- Over 1,000 annotated figures — offer descriptive, color annotations that reinforce the fundamental concepts of book.

New To This Edition
- Updated information on surface-mount devices
- Expanded coverage of the operation and examples of basic gates
- Increased coverage of encoders, decoders and multiplexers
- Expanded explanation of Schmitt triggers
- Several new troubleshooting examples
- New basic and intermediate-level problem sets
- Several new troubleshooting problems
- New MultiSIM examples and problems
- Real-world applications to support examples
- New and revised annotated figures
- Internet resources are referenced added throughout

Review

The first version of this book was released in 1987. This book contains many practical issues and examples for students of engineering technology. The author introduces the concept of hardware descriptive language in chapter 4, "Programmable Logic Devices", but does not cover Hardware Descriptive Language (HDL). Many examples of real digital circuits with appropriate output files is included. In chapter 5, "Boolean Algebra and Reduction Techniques," the author introduces different methods of simplifying Boolean equations. In chapter 7, "Arithmetic Operations and Circuits," there are discussions of constructing half-adder, full adder and arithmetic logic unit. Arithmetic Logic Units hve been extensively discussed in this chapter.

In chapter 13, "Shift Registers," the author covers shift register basics, parallel-to-serial conversion, recirculating register, serial-to-parallel conversion, ring shift counter, Johnson shift counter, shift register ICs, system design applications for shift registers, driving a stepper motor with a shift register, three-state buffers, latches, and transceivers.

"Multivibrators and the 555 timer," chapter 14, covers capacitor charge and discharge rates, astable multivibrators, monostable multivibrators, integrated circuit monostable multivibrators, retriggerable monostable multivibrators, astable operation of the 555 IC Timer, monostable operation of the 555 IC timer and crystal oscillators.

The final chapter "Microprocessor Fundamentals and 8051 Microcontroller," covers the 8051 family of microcontrollers, 8051 architecture, interfacing to external memory, 8051 instruction set, 8051 applications, data acquisition and control system application. This 18 chapter textbook comes with a CD and includes MultiSIM examples. In addition, the companion website for students and resources for the instructor are helpful. They include PowerPoint slides, test banks and in depth MultiSim examples.

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