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Views (Multiple Description Domains): The Y-Chart""
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""2.7 Summary of the Chapter""""2.8 Review Questions""; ""3 Introduction to Microprocessors and Microcontrollers""; ""3.1 Introduction""; ""3.1.1 Processor Architecture and Microarchitecture""; ""3.2 The Microprocessor""; ""3.2.1 General-Purpose Registers""; ""3.2.2 Arithmetic and Logic Unit (ALU)""; ""3.2.3 Control Unit""; ""3.2.4 I/O Control Section (Bus Interface Unit)""; ""3.2.5 Internal Buses""; ""3.2.6 System Clocks""; ""3.2.7 Basic Microprocessor Organization""; ""3.3 Microcontrollers""; ""3.3.1 Microcontroller Internal Structure""
""3.4 Microprocessor-Based and Microcontroller-Based Systems""""3.4.1 Microprocessor-based and Microcontroller-based Digital Systems Design Using Top-Down Technique""; ""3.5 Practical Microcontrollers""; ""3.5.1 AVR ATmega8515 Microcontroller""; ""3.5.2 Intel 8051 Microcontroller""; ""3.6 Summary of the Chapter""; ""3.7 Review Questions""; ""4 Instructions And Instruction Set""; ""4.1 Introduction""; ""4.2 Instruction Format""; ""4.2.1 Expressing Numbers""; ""4.2.2 Basic Instruction Cycle; Execution Path of an Instruction""; ""4.2.3 Clock Cycle and Instruction Cycle""; ""4.2.4 Labels""
""4.3 Describing the Instruction Cycle: Use of Register Transfer Language (RTL)""

Sommario/riassunto

Embedded systems are today, widely deployed in just about every piece of machinery from toasters to spacecraft. Embedded system designers face many challenges. They are asked to produce increasingly complex systems using the latest technologies, but these technologies are changing faster than ever. They are asked to produce better quality designs with a shorter time-to-market. They are asked to implement increasingly complex functionality but more importantly to satisfy numerous other constraints. To achieve the current goals of design, the designer must be aware with such design constraints and more importantly, the factors that have a direct effect on them.One of the challenges facing embedded system designers is the selection of the optimum processor for the application in hand; single-purpose, general-purpose or application specific. Microcontrollers are one member of the family of the application specific processors.The book concentrates on the use of microcontroller as the embedded system?s processor, and how to use it in many embedded system applications. The book covers both the hardware and software aspects needed to design using microcontroller.The book is ideal for undergraduate students and also the engineers that are working in the field of digital system design.Contents• Preface;• Process design metrics;• A systems approach to digital system design;• Introduction to microcontrollers and microprocessors;• Instructions and Instruction sets;• Machine language and assembly language;• System memory; Timers, counters and watchdog timer;• Interfacing to local devices / peripherals;• Analogue data and the analogue I/O subsystem;• Multiprocessor communications;• Serial Communications and Network-based interfaces.