

Question Paper Code : 91417
B.E./B. Tech. Degree Examination,
November/December 2014.

Sixth Semester

Electronics and Communication Engineering

EC 2354/EC 64/10144 EC 704—VLSI DESIGN

(Regulation 2008/2010)

(Common to PTEC 2354 - VLSI Design for B.E. (Part-Time)
Fifth Semester - Electronics and Communication
Engineering - Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A—(10 × 2 = 20 marks)

1. What is meant by body effect?

Ans: The threshold voltage V_{th} is not a constant with respect to the voltage difference between the substrate and the source of MOS transistor. This effect is called substrate-bias effect or body effect.

2. What is the need for design rules?

Ans: Layout rules are also referred to as design rules or ground rules. The main objective of the layout rules is to build reliability functional circuits in as small an area as possible. Layout design rules describe how small features can be and how closely they can be packed in a particular manufacturing process.

Two Types of Design Rules

- Lambda based rules
- Micron based rules.

3. Give the expression for Elmore delay and state the various parameters associated with it.

Ans: Elmore Delay Model: Viewing ON transistors as resistors, a chain of transistors as an RC ladder as shown in Figure. The Elmore

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Basic VLSI Design Technology Cherry Bhargava, Gaurav Mani Khanal, 2022-09-01 The current cutting edge VLSI circuit design technologies provide end users with many applications increased processing power and improved cost effectiveness This trend is accelerating with significant implications on future VLSI and systems design VLSI design engineers are always in demand for front end and back end design applications The book aims to give future and current VLSI design engineers a robust understanding of the underlying principles of the subject It not only focuses on circuit design processes obeying VLSI rules but also on technological aspects of fabrication The Hardware Description Language HDL Verilog is explained along with its modelling style The book also covers CMOS design from the digital systems level to the circuit level The book clearly explains fundamental principles and is a guide to good design practices The book is intended as a reference book for senior undergraduate first year post graduate students researchers as well as academicians in VLSI design electronics electrical engineering and materials science The basics and applications of VLSI design from digital system design to IC fabrication and FPGA Prototyping are each covered in a comprehensive manner At the end of each unit is a section with technical questions including solutions which will serve as an excellent teaching aid to all readers Technical topics discussed in the book include Digital System Design Design flow for IC fabrication and FPGA based prototyping Verilog HDL IC Fabrication Technology CMOS VLSI Design Miscellaneous It covers basics of Electronics and Reconfigurable computing PLDs Latest technology etc

Principles of VLSI and CMOS Integrated Circuits Jain Richa & Rai Amrita, 2016 For B E B Tech students of all Technical Universities Microelectronics VLSI Design is an emerging subject in the field of electronics in recent years It is an introductory source to internal parts of electronics at minute level This book is covering CMOS Design from a digital system level to circuit level and providing a background in CMOS Processing Technology The book includes basic theoretical knowledge as well as good engineering practice This book is recommended for B Tech M Tech and diploma students of all Indian Universities and also useful for competitive examinations

Eleventh International Conference on VLSI Design VLSI Society of India, IEEE Circuits and Systems Society, 1997 Areas covered in this work include physical design synthesis delay test and timing high level synthesis hardware software co design low power design verification VLSI synthesis testability enhancement asynchronous design diagnosis test and fault modelling and mixed signal design

Advanced VLSI Technology Cherry Bhargava, Gaurav Mani Khanal, 2022-09-01 The trend in design and manufacturing of very large scale integrated VLSI circuits is towards smaller devices on increasing wafer dimensions VLSI is the inter disciplinary science of the process of creating an integrated circuit IC by combining thousands of transistors into a single chip VLSI design can reduce the area of the circuit making it less expensive and requiring less power The book gives an understanding of the underlying principles of the subject It not only focuses on circuit design process obeying VLSI rules but also on technological aspects of prototyping and fabrication All the clocking processes interconnects and circuits of

CMOS are explained in this book in an understandable format The book provides contents on VLSI Physical Design Automation Design of VLSI Devices and also its Impact on Physical Design The book is intended as a reference book for senior undergraduate first year post graduate students researchers as well as academicians in VLSI design electronics electrical engineering and materials science The basics and applications of VLSI design from STA PDA and VLSI Testing along with FPGA based Prototyping are covered in a comprehensive manner The latest technology used in VLSI design is discussed along with the available tools for FPGA prototyping as well as ASIC design Each unit contains technical questions with solutions at the end Technical topics discussed in the book include Static Timing Analysis CMOS Layout and Design rules Physical Design Automation Testing of VLSI Circuits Software tools for Frontend and Backend design Proceedings,2003 **FPGA ...**,2003 Schedule of Classes University of California, San Diego,1994 **Digest of Technical Papers**,1985 Mathematical Reviews,2004 Cornell University Courses of Study Cornell University,2006 *International Symposium on System Synthesis*,2002 Novel Research and Development Approaches in Heterogeneous Systems and Algorithms Koley, Santanu,Barman, Subhabrata,Joardar, Subhankar,2023-03-07 Almost every element of life from commerce and agriculture to communication and entertainment has been profoundly altered by computing Around the world people rely on computers for the creation of systems for energy transportation and military use Additionally computing fosters scientific advancements that advance our basic understanding of the world and assist in finding answers to pressing health and environmental issues Novel Research and Development Approaches in Heterogeneous Systems and Algorithms addresses novel research and developmental approaches in heterogenous systems and algorithms for information centric networks of the future Covering topics such as image identification and segmentation materials data extraction and wireless sensor networks this premier reference source is a valuable resource for engineers consultants practitioners computer scientists students and educators of higher education librarians researchers and academicians **ICASSP 89**,1989 **Proceedings of the 1994 International Conference on Parallel Processing, August 15-19, 1994: Architecture** Dharma Prakash Agrawal,K. C. Tai,Jagdish Chandra,1994 **IEEE Transactions on Circuits and Systems**,2006 *Wireless Communications* International Engineering Consortium,2006 Containing essays from leading experts in the industry that discuss academic theories and practical applications of wireless communications this book focuses on the latest wireless technologies and advancements A diverse volume it seeks to shed light on such topics as business strategies and current trends while combining the perspectives of many specialists across the nation **30th Midwest Symposium on Circuits and Systems** Kamal Jabbour,1988 **Annual Review of Communications**,2005 **Undergraduate and Graduate Courses and Programs** Iowa State University,2007 *Forthcoming Books* Rose Arny,1997

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