

2010-2011

SVL-S 308

Department of Systems Design, Andhra University, Visakhapatnam

M.Sc.(Tech.) Degree Examination
VLSI Design

Third Semester

SYLLA

VL 303 – VLSI Design

(Effective from the admitted batch of 2010-2011)

Unit-1: MOS Transistor Theory

Gajski Chart in VLSI design domain - MOS structure - Biasing and operation of MOS - Scaling in MOS Circuits - Small geometry effects - MOS capacitances - Mobility variations - Hot electron effect.

MOS Inverter Design and Optimization

Static and switching characteristics - Resistive load inverters - Inverter with n-type MOSFET load CMOS inverters - Introduction to switching characteristics - Inverter delay time definitions and calculations - Delay constraints in inverter.

Unit-2: CMOS Combinational / Sequential Logic Design

Introduction - MOS logic circuits with depletion MOS load - CMOS NAND and NOR gates - Complex gate design - Pass transistor logic - Transistor gate logic [3]

CMOS Sequential Logic Design

Bistable elements - SR latch circuit - Clocked latch and flip-flop circuits - CMOS D-latch edge triggered flip-flop - CMOS SRAM design - CMOS DRAM design.

Unit-3: Dynamic Logic and Clocking Circuits


Dynamic pass transistor circuits - Dynamic transmission gate design - High performance dynamic logic circuits (Dynamic CMOS logic, C²MOS logic, CMOS Domino logic, NP domino, Zipper CMOS circuits) - Setup and hold time - Clock skew in CMOS circuits - PLL technique for clock synchronization[2].

Unit-4: CMOS Chip Design Options and I/O Design

Programmable Logic, Programmable Logic Structures, Programmable Interconnect, Reprogrammable Gate Arrays, Sea-of-Gate and Gate Array Design, Standard Cell Design[2], I/O Design-Introduction, ESD Protection, Input Circuits, Output Circuits and L(di/dt) noise, Latch-Up prevention.

Text Books

1. CMOS VLSI Design – Sung Mo Kang, Yusuf Leblebici
2. Principles of CMOS VLSI Design: A System Perspective – Weste H.E., Kamran Eshragian Neil
3. Digital Integrated Circuits – Jan M. Rabey
4. Digital Integrated Circuits: A Design Perspective – Rabaey, Chandrakasan, Nikolic
5. Principles of CMOS-VLSI Design: A Systems Perspective – Weste Eshraghian


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