M-SCHEME DETAILLED SYALLABUS

34053 VERY LARGE SCALE INTEGRATION

UNIT I COMBINATIONAL CIRCUIT DESIGN

NMOS and CMOS logic implementation of Switch, NOT, AND, OR, NAND, and NOR Gates CMOS Transmission Gate. Digital logic variable, functions, inversion, gate/circuits, Boolean algebra and circuit synthesis using gates (Up to 4 variables).

COMBINATIONAL CIRCUIT BUILDING BLOCKS

Circuit synthesis using Multiplexer, DE multiplexer, Encoders and Decoders, Arithmetic adder, Sub tractor and Comparator circuits. Hazards and races

UNIT II VHDL FOR COMBINATIONAL CIRCUIT

Introduction to VLSI and I ts design process. Introduction to CAD tool and VHDL: Design Entry, Synthesis, and Simulation. Introduction to HDL and different level of abstractions HDL Statements and Assignments

VHDL CODE

AND, OR, NAND, NOR gates, Implementation of Mux, Demux, Encoder, decoder. Four bit Arithmetic adder, sub tractor and comparator in VHDL

UNIT III SEQUENTIAL CIRCUIT DESIGN

Introduction/Refreshing to Flip flops and its excitation table, counters and Shift registers

DESIGN STEPS

State diagram, State table, state assignment Example for moore and mealy machines. Design of modulo counter (upto 3 bit) with only D flip-flops through state diagram

UNIT IV VHDL FOR SEQUENTIAL CIRCUIT

VHDL constructs for storage elements VHDL code for D Latch / D, JK and T Flip-flops with or without reset input.

VHDL EXAMPLES

Counters Synchronous counters - 2 bit & 3 bit up counter 3 bit up/down counter Decade counter, Johnson Counter

UNIT V PLDS AND FPGA

Introduction to PROM,PLA and PAL. Implementation of combinational circuits with PROM, PAL and PLA (up to 4 variables).Comparison between PROM, PAL and PLA Introduction to Complex Programmable Logic device, Field Programmable Gate Array Introduction to ASIC. Types Of ASIC

TEXT BOOK

 1. "Digital Design" M.Morris Mano Michael D Ciletti Pearson Education 2008

2. "Fundamentals of Digital Logic with VHDL design" Stephen brown and Vranesic 2nd edition McGrawHill,2008

3. "VHDL Primer" Bhasker J Prentice Hall India -2009

REFERENCES

1. "Digital Electronics with PLD Integration" Nigel P. Cook, Prentice Hall, 2000

2. "Programmable Logic Handbook: PLD, CPLD, and FPGA" Ashok K.Sharma, Mcgraw-Hill, 1998.