

B.E. (Computer Engineering)
VLSI & DIGITAL SYSTEM DESIGN
(2008 Course) (Elective - IV) (Semester-II) (410451A)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates:

- 1) Answer Question No.1 OR 2,3 OR 4, and 5 OR 6 from Section I and Q. No.7 OR 8, 9 OR 10 and 11 OR 12 from Section II.*
- 2) Answers to the two Sections must be written in separate answer books.*
- 3) Neat diagram must be drawn whenever necessary.*
- 4) Figures to the right indicate full marks.*
- 5) Assume suitable data, if necessary.*

SECTION -I

- Q1)** a) Explain layout design rules for devices and interconnects. [9]
b) Explain types of technology scaling. [8]

OR

- Q2)** a) Compare Speed-Power performance of available technologies. [9]
b) Explain different tools for device simulation. [8]

- Q3)** a) Explain fabrication of Cu interconnects with suitable diagram. [8]
b) Describe different limiting performance of CMOS. [9]

OR

- Q4)** a) Explain Shallow Trench Isolation (STI) with process flow. [8]
b) Explain the different process options for device isolation. [9]

- Q5)** a) Explain wet etching and plasma etching. [8]
b) Explain basic properties of Silicon Wafer. [4]
c) Explain Czochralski and Float-Zone Crystal growth methods. [4]

OR

- Q6)** a) Write a short note on: [8]
i) Nano imprint Lithography.
ii) Electron-beam lithography.
b) Explain Chemical vapor oxidation technique. [8]

P.T.O.

SECTION -II

- Q7)** a) Explain Island style and Row based FPGA architectures in detail. [8]
b) Explain different Modelling styles in HDL. [9]

OR

- Q8)** a) Explain following terms with examples: [9]
i) Identifier
ii) Variable
iii) Array
b) Draw state diagram and write VHDL Code for Traffic Light controller. [8]

- Q9)** a) Explain the types of programmable logic devices in detail. [8]
b) Explain Application Specific IC's Design flow. [4]
c) Explain role of interconnect in VLSI design. [4]

OR

- Q10)** a) Explain static and dynamic behaviour of CMOS devices and circuits. [8]
b) Explain role of software tools in digital design. Explain the types of software tools in VLSI design. [8]

- Q11)** a) List out different steps for designing clocked synchronous machine. [8]
b) Explain different design parameters for digital circuit design. [5]
c) Explain merits and demerits of FPGA. [4]

OR

- Q12)** a) Explain timing parameters for read and write operation in static RAM. [8]
b) For clock circuitry explain the following: [9]
i) Clock skew
ii) Clock jitter
iii) Slew

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