

Total No. of Questions : 12]

SEAT No. :

**P1465**

[4759] - 222

[Total No. of Pages :3

**B.E. (Computer)**

**VLSI & DIGITAL SYSTEMS DESIGN  
(2008 Pattern) (Semester - II) (Elective - IV)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data. if necessary.*

**SECTION - I**

**Q1) a)** Compare Speed-Power Performance of available technologies. [8]

b) Explain the types of technology scaling. [9]

OR

**Q2) a)** Explain the layout design rules for devices and interconnects. [9]

b) Explain the classification of IC technology based on design style. [8]

**Q3) a)** Explain Shallow Trench Isolation (STI) with process flow. [8]

b) Explain fabrication process for CMOS device. [9]

OR

**Q4) a)** Explain fabrication of Cu interconnects with suitable diagram. [8]

b) Write a short note on [9]

i) Gate formation

ii) Contact formation

iii) Source drain region formation

**P.T.O.**

- Q5)** a) Explain basic properties of Silicon Wafer. [4]  
b) Explain purification steps of raw silicon wafer. [4]  
c) Explain Chemical vapor oxidation technique. [8]

OR

- Q6)** a) Write a short note on [8]  
i) Optical Lithography  
ii) Thermal Oxidation  
b) Explain wet etching and plasma etching. [8]

**SECTION - II**

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

OR

- Q8)** a) Explain the following terms with examples. [9]  
i) Identifier  
ii) Variable  
iii) Array  
b) Write VHDL Code for Lift Controller. [8]

- Q9)** a) Explain the types of programmable logic devices in details. [8]  
b) Explain Application Specific IC's Design Flow. [4]  
c) Explain CMOS inverter with VTC. [4]

OR

- Q10)a)** Explain static and dynamic behavior 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)** Explain the metastability in details. **[5]**
- b) List out different steps for designing Clocked synchronous state machine. **[8]**
- c) Explain merits and demerits of CPLD. **[4]**

OR

- Q12)a)** Explain timing parameters for Read and Write Operation in Static RAM. **[8]**
- b) For Combinational Logic design explains the following. **[9]**
- i) Timing diagram
  - ii) Propagation Delay
  - iii) Timing specification

