

TEC-503

1349

Odd Semester Examination, 2017-18

B.TECH. (SEMESTER-V)

VLSI TECHNOLOGY

Time: 03:00 Hours

Max Marks : 100

Note : Attempt all questions.

1.. Attempt any four questions :

(5x4=20)

- (a) What do you mean by epitaxy? Explain vapor phase epitaxy with a neat diagram.
- (b) How do you obtain MSG form pure silicon? Give all the reactions that take place during the process.
- (c) Why packaging is required ? Explain dual line package.
- (d) Explain electron beam lithography.
- (i) Why SiO_2 is an important component in electronics?

2. Attempt any four questions :

(5x4=20)

- (a) What is 'channeling 'in an ion implantation process?
- (b) What do you mean by photoresists? Explain the various types of photoresists.
- (c) Give Fick's law of diffusion.
- (d) What is the thickness of the oxide grown by wet oxidation at a temperature of 1300°C at $t=0$ where $A=0.4\text{mm}$ and $B=0.720\mu\text{m}^2/\text{h}$.
- (e) Compare between CMOS and Bipolar Technologies.

3. Attempt any two questions :

(10x2=20)

- (a) What is lithography? Explain optical lithography in detail.
- (b) What do you mean by yield in VLSI? How you can have the product with overall high yield? Explain the trade offs.
- (c) Explain the kinetics of thermal oxidation.

TEC-503/1080

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4. Attempt any two questions : (10x2=20)
- (a) What do you mean by etching? Differentiate between dry and wet etching. Explain briefly plasma etching.
 - (b) How a NPN transistor can be fabricated? Explain all the steps of fabrication.
 - (c) Compare ion implantation process with diffusion. Describe a typical ion implanter.
5. Attempt any two questions : (10x2=20)
- (a) What is metallization and describe the problems associated with this process.
 - (b) Explain the following crystal growth methods
 - (i) Bridgmann method
 - (ii) Czocharski method
 - (c) Write a short note on package types and packaging design VLSI technology. What do you mean by DIP?
