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**Question Paper Code: 12072**

M.E. DEGREE EXAMINATION, DECEMBER 2013.

First Semester

VLSI Design

01PVL101 - VLSI TECHNOLOGY

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What are the different types of defects in real crystals?
2. What do you mean by oxide isolation defects?
3. What is the difference between the Raster scan and Vector scan?
4. Draw the equivalent circuit for an rf plasma discharge.
5. What is meant by P-Glass flow?
6. What is the effect of Bandgap-Narrowing?
7. Write any two basic equations which describe the impurity diffusion in silicon.
8. State how Monte Carlo method is used in Ion Implantation.
9. Mention different package types.
10. What is meant by eutectic die bonding?

PART - B (5 x 14 = 70 Marks)

11. (a) With relevant diagrams/graphs explain about Czochralski crystal growing techniques.

(14)

Or

- (b) List the different oxidation techniques. With necessary graphs explain each technique. (14)
12. (a) What are the properties of the Etch process and explain any two of the properties in detail. (14)

Or

- (b) With necessary diagrams explain about the process involved in x-ray lithography. (14)
13. (a) Derive the Flick's one dimensional diffusion equations and give the most commonly used solutions. (14)

Or

- (b) Draw the schematic diagram of implantation equipment and explain in detail. (14)
14. (a) Explain about the etching and deposition process in detail. (14)

Or

- (b) What are the special considerations to be considered for the fabrication of NMOS ICs. (14)
15. a) Draw the flow diagram of the basic assembly operations used in VLSI devices and explain. (14)

Or

- (b) With necessary diagram explain about different package fabrication technologies. (14)

PART - C (1 x 10 = 10 Marks)

16. (a) List the various measurement techniques for determining diffusivities in diffusion study and explain. (10)

Or

- (b) Draw the schematic of a chemical vapor deposition (CVD) reactor used for Electronic-Grade Silicon (EGS) and explain in detail. (10)