Time: 3 Hours **Max Marks: 80**

N.B. 1) Question No.1 is compulsory
2) Solve any three questions from the remaining questions.
3) Assume suitable data if necessary.

1. Solve any four of the following. **(5 Marks each)** 20

(a) Define Range and Projection range with respect to ion implantation.

(b) How to get Si from sand?

(c) State technological problem during the application of local oxidation.

(d) Explain RCA wafer cleaning method

(e) Explain SOI fabrication using bonded SOI and smart cut.

2. (a) Explain different defects in crystal. 10

(b) Explain Liquid phase epitaxy method with neat diagram. 10

3. (a) State difference between LPCVD, APCVD, PECVD. 10

(b) Explain nature of diffusion system and State diffusion equation. 10

4. (a) Enlist the steps of fabrication of CMOS inverter using twin tub process along with vertical cross-sectional view. 10

(b) State need of λ (lambda) based design rules and draw layout of CMOS based 2 input NAND gate. 10

5. (a) Explain ion implantation system and state need of annealing. 10

(b)Explain measurement techniques of resistivity, conductivity and mobility 10

6. Write short note on **any four** method 20

(a) Multi-gate MOSFET physics

(b) MESFET fabrication

(c) Application of carbon nano tube.

(d) Electronic package reliability.

(e) Comparison of Pin through hole and SMT packaging technique.

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