

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  $\lambda$  (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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