

Time: 3 Hours

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
- (a) State how MGS and EGS silicon are fabricated from sand. 5
 - (b) Explain the need of isolation techniques in MOSFET fabrication. 5
 - (c) Briefly explain four probe method for resistivity measurement. 5
 - (d) What is FinFET technology? 5
 - (e) Explain the types of Ion Implantation methods. 5
- 2 (a) Explain law of oxidation. Explain thermal oxidation method and state it's advantages. 10
- (b) Describe with neat diagram Haynes-Schockley experiment for measurement of drift mobility of n type semiconductor. 10
- 3 (a) Explain NMOS fabrication process steps along with cross sectional diagrams. 10
- (b) State the need of Epitaxial layer. Explain molecular beam epitaxy with diagram. 10
- 4 (a) Differentiate diffusion and Ion Implantation techniques in all aspects. 10
- (b) State need of λ (lambda) based design rules and draw layout of 2 input CMOS NAND gate using lambda-based design rule. 10
- 5 (a) Compare evaporation and sputtering methods for metal deposition. 10
- (b) Explain electron beam lithography in detail and state it's advantages. 10
- 6 Write short note on any **four**
- (a) Oxide layer patterning method 5
 - (b) Fabrication of MESFET 5
 - (c) Advantages of Nanowire Transistors 5
 - (d) SOI Technology 5
 - (e) Diffusion Mechanisms 5