30/11/2015 BE Sem VII - E/X - CBGS - ICT

N.B.

QP Code : 5901

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

Time: 3 Hours.

Max. Marks: 80

1. Solve any four of the following (20)
   (a) Explain predeposition and drive in steps in diffusion process.
   (b) Classify and discuss in brief the types of Thin Film Deposition methods.
   (c) What is Hall effect? Enlist important electrical parameters for which measurement is required before device processing begins.
   (d) Explain the need of isolation in VLSI and list the methods to accomplish it?
   (e) Explain SOI fabrication using bonded SOI and smart cut method.

2.
   (a) Explain Czochralski method for Silicon crystal growth. What are its advantages? (10)
   (b) What do you mean by Class of a clean room? Give the steps in a standard RCA cycle during wafer cleaning (10)

3.
   (a) Explain Solid source diffusion system with neat diagram. Also give one example of each source for P-type and N-type diffusion. (10)
   (b) Explain High K and Low K dielectrics with application of each. (05)
   (c) What are the basic reactions in formation of SiO_2 in dry oxidation and wet oxidation? Explain where these methods are used during MOSFET fabrication process. (05)

4.
   (a) Explain the fabrication process steps along with vertical cross-sectional views for CMOS inverter using N-well process (10)
   (b) What are the different types of design rules? Draw layout of 2 input NAND gate as per lambda (λ) based design rules (Show units in lambda). (10)

5.
   (a) Enlist important electrical parameters for which measurement is required before device processing begins. Also describe the experimental setup for the Four Probe method for resistivity measurement with the help of a neat diagram (10)
   (b) Explain the difference between SOI Finfet and bulk Finfet? (03)
   (c) State advantages of Finfet devices over single gate MOSFET devices. Also draw cross-sectional views of different multigate structures. (07)

6. Write short notes on any three of the following (20)
   (a) MESFET Fabrication
   (b) Carbon Nanotube Transistor
   (c) SOI Technology
   (d) Parametric tests and Functionality tests for IC testing