Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M.TECH (ECE.VLSI-OLD)/SEM-2/MVET-204/2011

2011
VLSI TECHNOLOGY

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Short Answer Type Questions)

1. Answer any *seven of the* following $7 \times 2 = 14$

   a) What is a CLASS 1000 clean room ?

   b) What is hybrid IC ?

   c) What is batch processing ?

   d) In an RF plasma system, what is the frequency commonly used ?

   e) What are the different alignment processes for photolithography ?

   f) What is negative & positive photoresist ?

   g) What is Miller index ?

h) What is rectifying contact ?

i) What is diffusion coefficient ?

j) What are the advantages of wet oxidation over dry oxidation ?

GROUP – B
(Long Answer Type Questions)

Answer any *four* questions. $4 \times 14 = 56$

2. a) Explain the different mechanisms of impurity diffusion.

   b) What are the Fick's laws of diffusion ? Explain their significance in Si IC processing. 5 + (5 + 4)

3. a) What is the need of cleaning & machining for wafer perparation ?

   b) Explain how organic components & inorganic components are removed from wafer.

   c) What are different machining processes involved in wafer preparation ? 5 + 4 + 5

4. a) Explain with suitable diagram dry & wet oxidation processes. Why in wet oxidation the water bubbler temperature is kept in 90°C ?

   b) Explain with neat diagram different point defects in crystal. (8 + 2) + 4

5. a) What is plasma ? Explain plasma etching process.

   b) Explain ion implantation for substrate doping. (2 + 6) + 6

6. a) What do you mean by lithography ? What is spin-coat & developer ?

   b) Explain photolithography process with neat diagram.

(2 + 4) + 8

7. Write short notes on any two of the following : 2 × 7

   a) CVD

   b) CZ method

   c) MBE

   d) Contact printing.