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Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

MEVD-201

M.E./M.Tech. (Second Semester)EXAMINATION, June 2012

(Grading/Non-Grading)

VLSI TECHNOLOGY

Time: Three Hours Maximum Marks:

GS:70

Note : Attempt any five questions.

1. (a) Explain Czochralski process and wafer preparation.(b) Discuss various defects in single crystal silicon. How a crystal of known orientation is grown? What are advantages of polysilicon gate over metal gate MOSFET?

2. (a) What is the role of clean rooms in IC fabrication? What are the different types of cleanrooms and how will you construct the clean room ?

(b) Discuss kinetics of oxidation. How junction isolation is done using LOCOS? Give purpose of oxidation.

3. (a) Explain Deal Grove model and post-oxidation evaluation.

(b) Discuss performance factor of photo resists. Explain photo masking process step with diagrams.

4. (a) Describe X-ray lithography and ten step process.

(b) Which material is mostly used for contacts in silicon wafer technology? Why and what are its limitations? Give remedial measures.

5. (a) Compare diffusion and ion-implantation process technology. What is channeling of ion-implant ions? How is it reduced?

(b) Explain PVD and CVD techniques with their application in VLSI technology.

6. (a) Explain vertical and horizontal tube furnaces used in oxidation and diffusion process.

(b) What is an epitaxy? Discuss and compare various types of epitaxy techniques.

7. (a) What are standard cleaning solutions? Explain HEPA filter used in clean room.

(b)Discuss Molecular Beam Epitaxy (MBE) with suitable example.

8. Write short notes on any two :

a) Silicon on sapphire and metallization

b)Electron beam exposure system

c) Electronic grade silicon preparation and post-oxidation evaluation