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TEC-503 77 Printed Pages : 3

Roll No. to be filled in your Answer Book

Roll No. | | | | | | | | | | |

B. Tech

(SEM V) (ODD Sem.) Examination, 2014

VLSI Technology

Time : Three Hours] [Max. Marks : 100

Note: Attempt all questions, the marks assigned to each question is indicated at question itself.

Q.1 Attempt any four : (5x4=20)

A. Describe and discuss various features of ICs with respect to discrete integral circuits.

B. What are the various steps involved in the manufacturing of a monolithic IC.

C. Why oxidation is done? Explain the chemistry of oxidation and kinetics of oxide growth.

D. A Silicon wafer with p type doping of 10^{15} is heated at 1000 °C for 1 hour in day oxygen. How much oxide has been grown?

E. Describes a Cz furnace. What are its advantages?

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F. All modern silicon MOSFET's are fabricated on <100> oriented Si substrate. Why?

Q.2 Attempt any four : (5x4=20)

A. What are the process variables which affect the diffusion process? Explain.

B. What is optical growth? What is the advantage of epitaxial process over diffusion and *Czo kralski* process?

C. What is Fick's Law? Explain its importance in theory of diffusion.

D. What is the MBE system? Explain with diagram.

E. Write short note on

(1) Photo mask and photo resists.

(2) Photo lithography techniques.

F. Does the thickness of the epitaxial wafer pose a problem in epitaxial processing from a stress view point? Discuss your answer.

Q.3 Attempt any two : (10x2=20)

A. Compare X-Ray and Ion-beam lithography.

B. What is etching? Explain its different types and write advantages & disadvantages of each.

C. What are proximity and projection printers Explain.

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Q.4 Attempt any two : (10x2=20)

A. What is metallization? Write its application and problem areas associated with it. Explain in brief.

B. Why depletion MOSFET is so called? Explain the operation and characteristics of n-channel depletion type MOSFET with suitable sketches.

C. (1) Draw the block diagram of 1 bit SRAM

(2) Sketch the circuit diagram of a ratio less MOS inverter. Explain its operation.

Q.5 Attempt any two : (10x2=20)

A. What are yield losses in VLSI? How they are modeled? What is its role in VLSI testing?

B. Explain VLSI assembly technologies.

C. Describe the commonly used VLSI testing procedures.

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