PAPER ID-411026

Roll No:

B. TECH
(SEM-V) THEORY EXAMINATION 2021-22
VLSI TECHNOLOGY

Time: 3 Hours

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. **Attempt all questions in brief.**   2 x 10 = 20

    a. Discuss oxide charges.

    b. What is electronic grade silicon.

    c. Explain the purpose of oxidation.

    d. How is wafer polishing done?

    e. What are positive and negative photoresist?

    f. What are the disadvantages of Electron Beam Lithography?

    g. What are the basic mechanisms of diffusion?

    h. State Fick's second law of diffusion.

    i. Why is metallization done?

    j. What is the disadvantage of Sputtering?

SECTION B

2. **Attempt any *three* of the following:**   10 x 3 = 30

    a. Explain Czocharlasky method of single crystal generation in detail.

    b. Explain Plasma Oxidation technique for the growth of oxide layer.

    c. Explain Chemical Vapor Deposition process.

    d. Demonstrate various diffusion profiles of dopant atom with appropriate
        equations and curves and compare them.

    e. What are the disadvantages of using Aluminum for metallization? How are
        they rectified?

SECTION C

3. **Attempt any *one* part of the following:**   10 x 1 = 10

    (a) Explain Float-Zone method of single crystal generation.

    (b) Demonstrate RCA cleaning with analysis of all steps and chemicals.

4. **Attempt any *one* part of the following:**   10 x 1 = 10

    (a) Explain Molecular Beam Epitaxy process in detail. Also write the advantages
        and disadvantages of this method.

    (b) Explain Deal-Grove's model for oxidation kinetics.

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5.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

(a)Explain the process of Electron Beam Lithography. Write down figures of merit

of Lithographic process.

(b)Explain the process of polysilicon film deposition.

6.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

(a)Determine total doping concentration, junction depth and doping profile in case of infinite source of diffusion.

(b)Explain Ion-Implantation process, its advantages and disadvantages.

7.   **Attempt any *one* part of the following:**   **10 x 1 = 10**

(a)Explain CMOS fabrication steps in detail.
(b) Briefly explain Vacuum Deposition and Sputtering for metallization.