

Subject Code: XXXXX

Roll No:

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BTECH
(SEM-5) VLSI TECHNOLOGY 2021-22

TIME:3 HOUR

Total Marks: 100

Instruction: Attempt the questions as per the given instructions. Assume missing data suitably.

SECTION - A

Attempt *All Parts* in Brief

2*10 = 20

Q1	Questions	Marks
(a)	Discuss oxide charges.	2
(b)	What is electronic grade silicon ?	2
(c)	Explain the purpose of oxidation.	2
(d)	How is wafer polishing done ?	2
(e)	What are positive and negative photoresist ?	2
(f)	What are the disadvantages of Electron Beam Lithography?	2
(g)	What are the basic mechanisms of diffusion?	2
(h)	State Fick's second law of diffusion.	2
(i)	Why is metallization done?	2
(j)	What is the disadvantage of sputtering ?	2

SECTION - B

Attempt Any Three of the following

3*10 = 30

Q2	Questions	Marks
(a)	Explain Czocharlaski method of single crystal generation in detail.	10
(b)	Explain Plasma Oxidation technique for the growth of wide layer.	10
(c)	Explain Chemical Vapor Deposition process.	10
(d)	Demonstrate various diffusion profiles of dopant atom with appropriate equations and curves and compare them.	10
(e)	What are the disadvantages of using Aluminum for metallization ? How are they rectified ?	10

SECTION - C

Attempt Any One of the following

5*10 = 50

Q3	Questions	Marks
(a)	Explain Float-Zone method of single crystal generation.	10
(b)	Demonstrate RCA cleaning with analysis of all steps and chemicals.	10
Q4	Questions	Marks
(a)	Explain molecular beam epitaxy process in detail. Also write the advantages and disadvantages of this method.	10
(b)	Explain Deal-Grove's model for oxidation kinetics.	10
Q5	Questions	Marks
(a)	Explain the process of electron beam lithography. Write down figures of merit of lithographic process.	10
(b)	Explain the process of polysilicon film deposition.	10
Q6	Questions	Marks
(a)	Determine total doping concentration, junction depth and doping profile in case of infinite source of diffusion.	10
(b)	Explain Ion-Implantation process, its advantages and disadvantages.	10
Q7	Questions	Marks
(a)	Explain CMOS fabrication steps in detail.	10

(b)

Briefly explain vacuum deposition and sputtering for metallization.

10