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Bengaluru

Mid Term Examinations - October 2026

Date: 05/10/2026 **Time:** 02:00 PM - 03:30 PM

Course Code: ECE3408 **Course Name:** IC Fabrication Technology

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3
Marks	44	24	22

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	what is meant by metallurgical-grade silicon (MGS)?	2	CO1	BT1
2	State the basic principle of optical lithography used in IC fabrication.	2	CO3	BT1
3	Define crystal growth in semiconductor fabrication.	2	CO1	BT1
4	Identify the basic principle of dry oxidation in silicon.	2	CO2	BT1
5	Write the Deal-Grove oxidation model equation.	2	CO2	BT1

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Illustrate the sequence of operations used to grow a single-crystal semiconductor ingot, beginning with the melting of high-purity semiconductor material and continuing through seed crystal dipping, rotation, controlled pulling, crystal growth, and cooling of the grown ingot. Describe the working of the crystal-growth technique represented by this process.	10	CO1	BT2
7	Compare single-crystal and polycrystalline silicon in terms of their crystal structure, properties, and applications in IC fabrication.	10	CO1	BT2

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Describe the Deal-Grove oxidation model with reference to the mechanism of oxide growth, oxidation kinetics, linear and parabolic growth regimes, and the influence of temperature, oxidation time, and dry or wet oxidizing ambient on oxide thickness and quality in IC fabrication.	10	CO2	BT2
9	Illustrate the working principles of dry and wet thermal oxidation of silicon with neat figures, highlighting the movement of oxidizing species and the formation of the SiO_2 layer.	10	CO2	BT2

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	Discuss the different types of crystal defects in silicon, their origins, and their effects on the electrical characteristics of semiconductor devices.	10	CO1	BT2

11	Describe the overall sequence of basic IC fabrication steps and the role of each stage in converting a silicon wafer into a functional device. Discuss how process integration influences device performance, yield, and reliability.	10	CO1	BT2

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	Describe the complete optical lithography process flow, including surface preparation, photoresist coating, exposure, development, and pattern transfer, and discuss the role of each stage in obtaining the required pattern on the silicon wafer.	10	CO3	BT2
13	Discuss the working principles, characteristics, advantages, limitations, and applications of wet and dry etching techniques used for transferring lithographically defined patterns onto a silicon wafer.	10	CO3	BT2