Course Code: D25157A0

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(AUTONOMOUS)

I – M. Tech I-Semester Regular Examinations (BR25), Feb - 2026

VLSI Technology (VLSI)

Time: 3 hours Max. Marks: 60

Answer any Five Questions One Question from One UNIT
ALL the Questions Carry Equal Marks

	UNIT-I	**Marks**	**CO**	**BL**
1 a)	Discuss the properties of semiconductor materials used in VLSI technology	6M	CO1	L2
b)	Explain the basic IC fabrication steps such as oxidation, diffusion, lithography, and CVD.	6M	CO1	L2
	OR			
2. a)	Explain the silicon crystal growth from melt (Czochralski method) with advantages and limitations.	6M	CO1	L2
b)	Describe various material characterization techniques employed in semiconductor manufacturing.	6M	CO1	L2

	UNIT-II	**Marks**	**CO**	**BL**
3.a)	Describe the thermal oxidation of silicon, including dry and wet oxidation mechanisms.	6M	CO2	L2
b)	Explain oxide quality parameters and methods used to improve oxide reliability.	6M	CO2	L2
	OR			
4.a)	Discuss impurity redistribution during oxidation and its impact on device performance.	6M	CO2	L2
b)	Explain optical lithography in terms of resolution, throughput, and cost.	6M	CO2	L2

	UNIT-III	**Marks**	**CO**	**BL**
5.a)	Describe the principle, process steps, and applications and dry etching in VLSI fabrication.	6M	CO3	L2
b)	Explain isotropic etching with respect to selectivity, and applications.	6M	CO3	L2
	OR			
6.a)	Explain the diffusion mechanism in silicon and derive constant-source and limited-source diffusion profiles.	6M	CO3	L2
b)	Explain extrinsic diffusion and discuss their effects on device dimensions.	6M	CO3	L2

	UNIT-IV	**Marks**	**CO**	**BL**
7.a)	Describe the principle and steps involved in ion implantation	6M	CO4	L2
b)	Explain dielectric deposition techniques and discuss their role in modern IC manufacturing.	6M	CO4	L2
	OR			
8.a)	Explain epitaxial growth techniques in VLSI technology.	6M	CO4	L2
b)	Discuss implantation-induced damage and explain the role of annealing in restoring crystal structure.	6M	CO4	L2

	UNIT-V	**Marks**	**CO**	**BL**
9.a)	Discuss the **of** passive components in modern VLSI fabrication processes	6M	CO5	L2
b)	Explain MESFET technology in high-speed circuits.	6M	CO5	L2
	OR			
10.a)	Discuss electrical testing and IC packaging techniques used in semiconductor manufacturing.	6M	CO5	L2
b)	Explain IC packaging methods procedures in semiconductor industries.	6M	CO5	L2

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