Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER III (NEW) – EXAMINATION – WINTER-2016

Subject Code: 2734202 **Date:25/10/2016**

Subject Name: IC Fabrication Technology

Time:02:30 pm to 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What is Clean Room and why it is required? Write down the clean room classification as per federal standard 209 D.	**07**
	(b)	Give the Comparison between Silicon and Germanium. Which is best suited for wafer fabrication.	**07**
Q.2	**(a)**	List down the different size of wafer and how we can identify it. What are the major obstacles to move from 300mm to 450mm size wafer?	**07**
	(b)	What is oxidation? Why it is needed? Explain the difference between transport limited and reaction rate limited oxidation of silicon.	**07**
		OR	
	(b)	Discuss effect of sodium contamination on the performance of pMOS and nMOS Transistors.	**07**
Q.3	**(a)**	In VLSI why E-beam lithography is widely used? What is PMMA? Discuss E-beam lithography.	**07**
	(b)	What is diffusion? Explain Predeposition and Drive-In techniques to introduce phosphorous impurity in p-type<100> silicon Substrate. Explain Importance of O_2 gas mixed with nitrogen gas.	**07**
		OR	
Q.3	**(a)**	What is the difference between positive and negative resist? What is the difference between emulsion and chrome mask?	**07**
	(b)	Explain role of O_2 in furnace technique. What do you mean by solid solubility?	**07**
Q.4	**(a)**	Explain why shallow junction is needed for smaller geometry devices?	**07**
	(b)	Why AlSi and ALSiCu are used in place of pure Al in fabrication of VLSI Circuit?	**07**
		OR	
Q.4	**(a)**	How RC time constant is decreased in multilevel metallization scheme?	**07**
	(b)	Explain RF Sputtering technique to deposit AlSiCu alloy for shallow junction devices.	**07**
Q.5	**(a)**	What is wet and dry etching? Which technique is generally used to get anisotropic etching? Why?	**07**
	(b)	Explain Junction Spiking and Electromigration in pure Al film.	**07**
		OR	
Q.5	**(a)**	Explain electrostatic discharge damage in IC. Discuss protection network in the Circuit.	**07**
	(b)	Explain the different types of wafer based on wafer cut.	**07**

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