BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

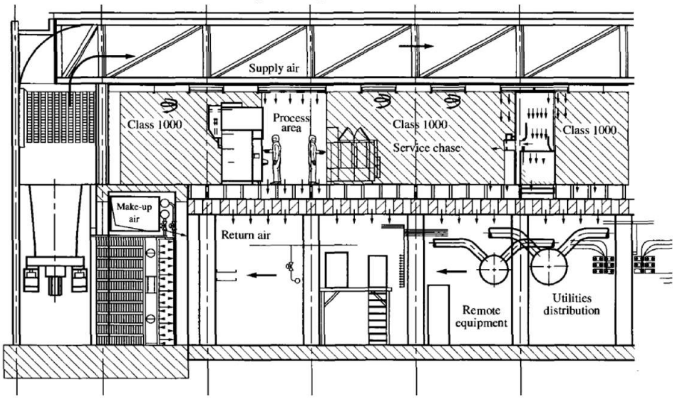
CLASS: MTECH **SEMESTER : II**
BRANCH: ECE **SESSION : SP/2023**

SUBJECT: EC587 IC TECHNOLOGY

TIME: 3 Hours **FULL MARKS: 50**

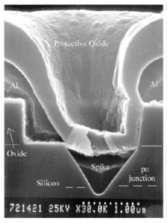
INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	With reference to the cleanroom layout given below, describe the following.	[5]	1	BL4

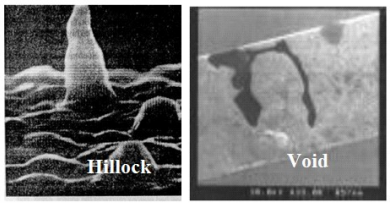


(a) Make up air system (b) HEPA filter, (c) Class 1000 Cleanliness class, (d) Pressurization in the process area, and (e) DI Water system

Q.1(b)	What type of contaminants are removed by RCA wet cleaning processes? Explain the significance of each step in the RCA wet cleaning processes.	[5]	1	BL2
Q.2(a)	Explain the Czochralski technique for crystal growth with a neat diagram.	[5]	2	BL2
Q.2(b)	Describe the different steps involved in the wafer manufacturing process with neat sketch.	[5]	2	BL2
Q.3(a)	Outline why oxidation is done and distinguish between dry and wet oxidation ? Draw a labelled diagram of a thermal oxidation setup.	[5]	3	BL4
Q.3(b)	Discuss the applications of metallization. With reference to Aluminium metallization, explain the reason for following kind of defects.	[5]	3	BL4



(a)



(b)

Q.4(a)	What is the advantage of diffusion technique over the ion implantation technique for introducing dopant in silicon. State the techniques of determining junction depth in diffused junction.	[5]	4	BL4
Q.4(b)	Briefly explain the ion implantation technique used for impurity doping in silicon. What is the crystalline quality of the target (Silicon substrate) after ion implantation process?	[5]	4	BL2
Q.5(a)	With help of suitable diagram for optical lithography pattern transfer process, distinguish between positive and negative photoresists.	[5]	5	BL4
Q.5(b)	Write short notes on **any two** (a) Dry etching, (b) Bulk Micromachining and (3) Wet Chemical etching	[5]	5	BL2

::::::27/04/2023::::::E