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

CLASS: MTECH **SEMESTER : II**
BRANCH: ECE **SESSION : SP/2024**

SUBJECT: EC357 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)	Relate short notes for ANY TWO, (a) Make up air system (b) HEPA filter, (c) Class 1000 Cleanliness class, (d) Pressurization in the process area,	[5]	1	3
Q.1(b)	Based upon your understanding of Cleanroom equipment and facilities, prepare a 2-dimensional layout plan for cleanroom (single floor) and show positioning of all equipment. You may assume the dimensions as per your understanding.	[5]	1	5
Q.2(a)	Describe the silicon float zone process for silicon crystal ingot production with help of a labeled diagram.	[5]	2	2
Q.2(b)	Describe the process for Chemical vapor deposition for silicon.	[5]	2	2
Q.3(a)	Briefly assess a suitable deposition method for the deposition of silicon dioxide on silicon wafer. If a silicon oxide layer of thickness x is grown by thermal oxidation, what is the thickness of silicon being consumed? The molecular weight of Si is 28.9 g/mol, and the density of Si is 2.33 g/cm^3. The corresponding values for SiO_2 are 60.08 g/mol and 2.21 g/cm^3.	[5]	3	6,4
Q.3(b)	Compare between junction spiking and electromigration phenomenon observed during aluminum metallization.	[5]	3	4
Q.4(a)	Discuss the various techniques used for evaluation of diffused layer in silicon or germanium wafers.	[5]	4	2
Q.4(b)	Illustrate the implant damage caused in wafer during ion implantation.	[5]	4	2
Q.5(a)	With help of suitable diagram for optical lithography pattern transfer process, distinguish between positive and negative photoresists.	[5]	5	4
Q.5(b)	Write short notes on any two (a) Dry etching, (b) Ion Beam Lithography and (3) Wet Chemical etching	[5]	5	2

::::::26/04/2024::::::M