

4. Draw the schematic of an ion implantor and explain its working principle. Derive the expression for range using the stopping powers. 6+4=10
5. Derive the expression of oxide thickness as a function of time and show that it is linear and parabolic for small and large values of oxidation time. Discuss the dry and wet oxidation techniques. 6+4=10
6. What are different etching techniques? Discuss the procedure of Si and SiO<sub>2</sub> etching. 6+4=10
7. Draw the schematic of a diffusion system and explain its working principle. Derive the expression for doping profile for constant surface concentration type diffusion. 5+5=10
8. What is metallization? Discuss the Al metallization process. Draw the structure of QFP and PGAIC packages. Discuss the flip-chip bonding process with a neat diagram. 2+2+2+4=10

\*\*\*\*\*

## B.Tech Even Semester Examination, May, 2025

### Electronics & Communication Engineering

(4th Semester)

**Course No: ECE-407***(Microelectronics Technology)**Full Marks: 50**Pass Marks: 25**Time: 2 hours***Note:**

1. Attempt any five questions.
  2. Begin each answer in a new page
  3. Answer parts of a question at a place
  4. Assume reasonable data wherever required
  5. The figure in the right margin indicates full marks for the question
  6. All the mathematical symbols and abbreviations have their usual meanings.
1. Explain the Float zone crystal growth technique with a neat diagram. What are advantages of integrated circuits? 6+4=10
  2. Explain the molecular beam epitaxy technique with a clear diagram. Discuss the oxide growth techniques. 6+4=10
  3. Define M 3.5 class room in metric system. Define the terms:
    - (a) photoresist
    - (b) resolution and
    - (c) registration.

Explain the different exposure techniques used in photolithography? 2+3+5=10