

B.Tech. VIII Semester (Main & Back) Examination, April-2019
 Electronics & Communication Engg.
 8EC1A IC Technology

Time : 3 Hours

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Maximum Marks : 80
 Min. Passing Marks : 26

Instructions to Candidates:

Attempt any Five questions, selecting One question from each unit. All Questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly Units of quantities used/calculated must be stated clearly).

Unit - I

1. a) Explain the various steps for shaping of crystal obtained from float zone or Cz method. (10)
- b) Find the concentration of Boron in crystal at fraction solidified of 0.4, if solid concentration (C_s) at fraction solidified 0.05 is 2×10^8 atoms/ cm^3 and segregation coefficient is 0.8. (6)

(OR)

1. a) Mention the reason for the following :
- Point defects.
 - Surface defects.
 - Volume defects.
- How these defects changes during the fabrication process. (8)
- b) How EGS is obtained from MGS. Also draw the block diagram for the production of EGS and also write it's chemical reaction. (8)

Unit - II

2. a) Define the following terms with respect to oxidation:
- Oxidation techniques. (4)
 - Oxide properties. (4)
- b) Arsenic is diffused in silicon with a doping concentration of 5×10^{17} atoms/ cm^3 . Arsenic doping assumes a profile of Gaussian type. Arsenic is diffused for 30 minutes and a junction depth of $20 \mu\text{m}$ is achieved with a surface concentration of 2×10^{18} per cm^3 . Find the diffusivity of arsenic. (8)

(OR)

2. a) Show analytic solutions of Fick's law and explain the correction in this theory. (8)
- b) Write the range theory of Ion Implantation. (8)

Unit - III

3. a) Explain chemical equilibrium and the law of mass action. (7)
- b) What is autodoping and how can this be minimized? (5)
- c) Compare LPCVD with APCVD. (4)

(OR)

3. a) What do you mean by Epitaxy? Explain vapor phase epitaxy and defects in epitaxial growth. (8)
- b) Explain the molecular beam epitaxy. (8)

Unit - IV

4. a) Explain the projection printing with suitable diagram. (8)
- b) Compare Wet Etching with plasma Etching. (8)

(OR)

4. a) What is optical lithography? Explain proximity printing and compare it with contact and projection printing. (8)
- b) Draw the Flow chart for Mask generation process. Explain each term with proper explanation. (8)

Unit - V

5. a) Write the fabrication process sequence for twin tub CMOS process. (8)
- b) Write technical note on:
- i) Metallization. (4)
- ii) Planarization. (4)

(OR)

5. a) Explain Bipolar IC fabrication process sequence with help of neat sketch. (8)
- b) Write short notes on following:
- i) LOCOS method. (4)
- ii) SOI techniques. (4)