

Exam.Code:0975
Sub. Code: 34642

2125
M. Tech. (Micro-Electronics)
First Semester
MIC-102: Integrated Circuit Technology

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

1. (a) What are the main goals of semiconductor manufacturing?
- (b) Define the term *yield* in semiconductor manufacturing.
- (c) Explain the importance of wafer cleaning techniques.
- (d) Explain the purpose of RTP (Rapid Thermal Processing) in IC fabrication.
- (e) What are the main steps involved in IC packaging. (5x2)

UNIT - I

2. (a) Explain photolithography with neat sketches. Discuss each step involved in the process.
- (b) Discuss Chemical Vapour Deposition (CVD) techniques. Explain the deposition of silicon dioxide and silicon nitride using CVD. (2x5)
3. (a) Discuss various failure mechanisms in metal interconnects and the measures taken to reduce them in VLSI circuits.
- (b) Explain plasma etching and Reactive Ion Etching (RIE) processes with diagrams. (2x5)
4. (a) Discuss process integration steps for MOS and PMOS circuits. Explain how each technology differs in fabrication and performance.
- (b) What is lithography? Draw and explain e-beam lithography process. (2x5)

P.T.O.

(2)

UNIT - II

5. (a) Explain the Bipolar IC fabrication process in detail. Describe the main steps involved and discuss the advantages of bipolar integrated circuits.
- (b) What is dielectric isolation? Explain the method of dielectric isolation used in ICs and its advantages over junction isolation. (2x5)
6. (a) Discuss CMOS FET technologies and describe how CMOS transistors are fabricated on a single chip.
- (b) Explain the SOS CMOS process (Silicon on Sapphire). Describe the fabrication steps, and limitations of SOS technology. (2x5)
7. (a) Explain the concept of regression modeling. Describe the significance of regression analysis in process modeling.
- (b) Describe the Analysis of Variance (ANOVA) technique used in regression modeling. (2x5)

x-x-x