

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER M. TECH DEGREE EXAMINATION

Electronics & Communication Engineering
(VLSI & EMBEDDED SYSTEMS)

04EC6501—VLSI TECHNOLOGY

Max. Marks : 60

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. What are the advantages of Ion implantation technique?
2. Explain the process of production of Metallurgical Graded Silicon
3. Explain the difference between Direct and indirect band gap materials.
4. Why npn transistor preferred compare to the pnp transistor.
5. A silicon *pn* junction employs $N_A = 2 \times 10^{16} \text{ cm}^{-3}$ and $N_D = 4 \times 10^{16} \text{ cm}^{-3}$. Determine the built-in potential at room temperature ($T = 300 \text{ K}$).
6. Define Schottky barrier
7. Plot the I_D - V_{DS} characteristics for different values of V_{GS} .
8. Define velocity saturation

PART B

Each question carries 6 marks

9. with neat diagram Explain Ion implantation process in fabrication of ICs

OR

- 10 Explain the photolithographic process with printing Techniques

11. Explain the epitaxial growth process

OR

12. Explain CVD reactors with neat diagram

13. Derive diode equation.

OR

14. Explain Zener Breakdown and Avalanche Breakdown

15. Explain base width modulation with diagram.

OR

16. Explain Tunnelling Barrier with energy band diagram

17. Draw the Structure of MOSFET and Explain principle of operation.

OR

18. Explain channel length modulation with diagram.

19. Explain the technique dielectric isolation used in VLSI technology with advantages and disadvantages

OR

20. Explain velocity saturation effects in MOSFETs.