

Government College of Engineering, Aurangabad
(An Autonomous Institute of Government of Maharashtra)

M.E. (EC) Examination
End Semester Examination December 2016

ET-548: Solid State Devices

Time: Three Hours

17 DEC 2016

Max. Marks: 60

“Verify the course code and check whether you have got the correct question paper”

N.B.: -

1. Attempt any four questions
2. Figures to the right indicates full marks
3. Assume suitable data if necessary and state it clearly
4. Use of non-programmable calculator is allowed

- Q1 A Explain types of solids, space lattice and Miller indices. 8
B Represent imperfections and impurities in solids diagrammatically and explain. 7
- Q2 A Explain velocity saturation, electron concentration, conductivity versus temperature and negative differential mobility. 8
B What is “Compensated Semiconductor”? Discuss with suitable energy band diagrams. Also comment on electron concentration versus temperature. 7
- Q3 A Explain space charge width, junction capacitance and one sided junction in case of reverse bias PN junction. 8
B Draw and explain the energy band diagram of PN junction when bias applied is zero. 7
- Q4 A Briefly describe the structure and operation of MOSFET. 8
B Describe the general fabrication technique of PN junction. 7
- Q5 A Define Ambipolar transport. Describe its equation and applications. 8
B Write a note on carrier generation, recombination and continuity equation. 7
- Q6 A State and explain Schrodinger’s wave equation. What is the physical meaning of the wave function? Determine first three allowed electron energies in the hydrogen atom. 8
B Describe any one method for growth of semiconductor material. 7