COLLEGE OF ENGINEERING, PUNE
END SEMESTER EXAMINATION
(MT-403) Electronic and Magnetic Materials

Year: B-Tech   Branch: Metallurgy
Academic Year: 2013-14   Date: 22 November' 13
Duration: 3 Hours   Max Marks: 60

Instruction to candidates:-
1. **All questions are compulsory.**
2. **Assume suitable data if necessary.**

Q.1) (A) Write note on: [5]
                a) Domain wall
                b) Hall Effect and its application

       (B) The electrical resistivity of pure Si is 2.3×10^3 Ω.m at R.T. 27°C. Calculate its   [4]
electrical conductivity at 200°C. Assume that Eg of Si is 1.1 eV. $R=8.62\times10^{-5}$ eV/K

Q.2) What is Drift Velocity of electrons in conducting metal   [4]
<div align="center">OR</div>

Write note on Domain wall motion

Q.3) (A) Write a brief note on : Messiner's Effect   [5]

       (B) Explain Type I and Type II superconductors in details with examples   [5]

Q.4) How does incident light interact with following material (any 3)   [6]
                a) Metals
                b) Glasses
                c) Plastics
                d) Semiconductors

Q.5) Explain in details working of lasers? Gives examples of different types of   [5]
lasers

Q.6) (A) What is optical anisotropy, explain in details. Name few materials showing   [5]
optical anisotropy

       (B) Write note on : Optical Fibers on following points   [5]
                a) Construction
                b) Types
                c) Working principle

Q.7) Write in details about different polarization mechanisms   [6]

Q.8) (A) Explain what is Polarization and Polarizibility [5]

(B) Calculate polarization of BaTiO3 crystal. The shift of titanium ion from the [5]
body centre is 0.06 A°. The oxygen anions of the side faces shift by 0.06A°.
While the oxygen anions of the top and bottom faces shift by 0.08A°, all in
direction opposite to that of titanium ion.

****