ASSIGNMENT 4

SUPERCONDUCTIVITY

1. Explain the phenomenon of superconductivity.

2. Write down the applications of superconductors.

3. Describe BCS theory of superconductivity.

4. What is Meissner effect? Prove that superconductors are perfect diamagnetic materials.

5. List various properties of superconductor. Explain in brief any three properties out of them.

6. Define: Penetration depth in the vicinity of Superconductivity.

7. The Critical temperature of superconductor is 9.15K. At zero Kelvin the critical field is 0.196 Tesla. Calculate the field at 6K.

8. Explain Josephson`s Junction and its applications.

9. The critical magnetic field of Niobium is 1×10^5 Tesla at 8 K and 2×10^5 Tesla at 0 K. Calculate the transition temperature of the element.

10. Calculate the critical current for a superconducting wire of lead having diameter of 1 mm at 4.5 K. Critical temperature for lead is 7.2 K and critical magnetic field at 0 K is 6.5×10^4 A/m.

11. Differentiate Type – I and Type – II superconductors.