Date: 18-04-2017   Dept. No.   Max. : 100 Marks
    09:00-12:00

PART A (10 X 2 = 20)

Answer ALL questions

1. Define crystal lattice.
2. What are basis vectors?
3. What is reciprocal lattice?
4. State Bragg's law.
5. What is the basic difference between Einstein's model and Debye model of specific heat?
6. Write Gruneisen relation..
7. Write Wiedemann Franz law.
8. Define Hall Effect.
9. What is Meissner effect?
10. What are SQUIDS?

PART B (4 x7. 5 = 30)

Answer any FOUR questions.

11. What are Miller indices? Explain the procedure for finding the Miller indices of a plane.
12. Explain Rotating-crystal method of crystal structure analysis.
13. Derive Debye formula for specific heat.
14. Explain density of available electronic states D (E).
15. List the properties of type I and type II superconductors.

PART C 4 x 12.5 = 50)

Answer any FOUR questions

16. What are Bravais lattices? List them with the conditions on unit cell constants.
17. Derive Laue equations for X-ray diffraction by crystals. Show that these equations lead to Bragg's law.
18. Obtain an expression for specific heat capacity using Einstein model.
19. Explain Sommerfeld theory of electrical conductivity.
20. Explain DC Josephson effect.

****