SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
M.Sc. Physics - END SEMESTER EXAMINATIONS APRIL - 2024
SEMESTER -IV
20PPHCT4010 - Condensed Matter Physics

Total Duration : 2 Hrs. 30 Mins.   Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Show the atomic packing fraction of BCC Crystal structure is 68%.

2. Prove that the reciprocal lattice for a face centred cubic is body centred cubic.

3. Obtain the expression for hall coefficient.

4. Draw the B-H curve for ferromagnetic material and explain the different stages of magnetisation process on the basis of domain theory.

5. What are magnons? Give brief account on thermal excitation of magnons.

6. Differentiate Type I and Type II superconductors.

7. Derive carrier concentration of electrons in conduction band.

8. Give an account of BCS theory of superconductivity.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Give a brief account on Laue equations for diffraction of X-rays by a crystalline solids.

10. On the basis of free electron theory derive an expression for electrical and thermal conductivity of metals and hence establish Wiedemann-Franz law.

11. Describe the Quantum theory of paramagnetism.

12. What is Josephson Effect? Explain AC Josephson Effect.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Derive the expressions of London equations in super conductivity.

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