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 2025
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. Copper has FCC structure and the atomic radius is 0.1278 nm. Calculate the inter planar spacing for (110) and (212) planes.
2. Discuss inelastic scattering by phonons.
3. Based on Kroning penny model, discuss the characteristic features of electron propogation in crystals.
4. What are magnons ? Discuss the thermal excitation in Magnons and obtain the Bloch $T^{3/2}$ law.
5. Explain Meissner effect and distinguish between Type I and Type II super conductor.
6. Determine the Miller indices of a plane. which is parallel to X-Axis and cuts intercepts of 2 and $1/2$ along y-axis and Z-axis respectively.
7. Explain Band theory of metals and semiconductors.
8. Describe Quantum theory of paramagnetism.

Section C

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

9. Describe Laue's experiment and point out its significance.
10. Derive an expression for specific heat of solids using Debye theory.
11. With suitable diagrams, Discuss the Hall effect in semiconductor and highlight the significance of Hall coefficient,
12. Derive London's equation for superconductivity.

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

13. Discuss the Heisenberg's interpretation on internal field in ferro magnetic materials.

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