B.Sc 5th Semester Unit Test 2024

Paper: PHY-HC-5026

Time: 60 minutes | Date: 25-09-2024 | Total marks: 20

A. ***Answer the following questions***: 1 x 4 = 4

1. What is meant by polarisation?
2. The S.I. unit of electric susceptibility is ……
3. The maximum angular frequency of monoatomic linear lattice vibration is …….
4. What is Curie law and Curie temperature?

B. ***Answer the following questions: (any three)*** 2 x 3 = 6

1. Write the difference between unit cell and primitive cell.
2. Write the difference between normal conductivity and super-conductivity.
3. Write a short note on Meissner effect.
4. What do you mean by normal and anomalous dispersion?
5. What are the branches produced in diatomic linear lattice vibrations at higher frequencies?
   The band between frequencies and of a diatomic linear lattice is known as ……..
6. What do you mean by diamagnetic, paramagnetic and ferromagnetic substances. Give examples.

C. ***Answer the following questions: (any two)*** 5 x 2 = 10

1. What is Bravais lattice? Write about its type in case of 3-D crystal.
2. What is coordination number? Mention the coordination number of SCC, BCC and FCC type of crystals.
3. Derive the relationship between electric susceptibility and dielectric constant.
4. Prove that for a one-dimensional monoatomic lattice, dispersion curve meets the zero boundary in a normal direction.
5. Discuss the formation of allowed and forbidden energy bands on the basis of the Kronig-Penny model.
6. What are intrinsic and extrinsic semiconductors? How p-type and n-type semiconductors prepared?
7. Give the classical theory of diamagnetism?
8. Give the Langevin's theory of paramagnetism?

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