



Shree H.N. Shukla group of colleges

PHYSICS
T.Y.B.Sc. (Sem. VI) (CBCS)
QUESTION BANK
PAPER- 602

SECTION-A

Q.1: One marks questions:

[5 MARKS]

- 1 The electrons are regarded as _____.
- 2 "Fermions" are identical and indistinguishable particles with _____ spin.
- 3 How many coordinates does the phase space have ? Name them.
- 4 Which type of statistical law is applicable for photons?
- 5 What is the least volume for occupied by the Phase cell?
- 6 Define : Basis, Lattice
- 7 Give the names of seven crystal system.
- 8 Define : Hydrogen bond.
- 9 In covalent bond the spins of two electrons are _____.
- 10 Give one example of ionic crystal and covalent bond.
- 11 Superconducting material act like as perfect _____ .
- 12 BCS theory is based on _____.
- 13 London's penetration depth $\lambda =$ _____.
- 14 Who observed phenomena of superconductivity ?
- 15 Current density $J =$ _____.

SECTION – B

Q.2 (A): Short Questions:

[2 Marks each]

- 1 Give the expression for Maxwell Boltzmann statistics ?
- 2 Give two examples of each of Boltzons, Fermions and Bosons.
- 3 Find the value of $50!$ using Stirling's approximation.
- 4 Draw the plane of Miller indices (001), (010).
- 5 Draw the plane of Miller indices (011), (111).

- 6 Find the ratio of intercepts on the three axes by (123) plane in a simple cubic crystal.
- 7 Define Josephson effect.
- 8 What is transition temperature ?
- 9 Explain : critical field.

Q.2 (B) : Short questions:

[3 Marks each]

- 1 State and prove the Sterling's approximation.
- 2 Give the expression for F-D AND B-E statistics ?
- 3 Define : Macro states and Micro states.
- 4 Explain simple cubic (SC) structure.
- 5 Explain ionic crystal bond.
- 6 Explain covalent crystal bond .
- 7 Explain superconductivity.
- 8 List the properties which don't change in superconductor transition.
- 9 Explain Meissner effect.

Q.2 (C): Write Detail Note ON :

[5 Marks each]

- 1 Define distribution law for Maxwell Boltzmann statistics.
- 2 Define distribution law for Fermi Dirac statistics.
- 3 Define distribution law for Bose - Einstein statistics.
- 4 Give comparison between M-B, F-D, and B-E statistics .
- 5 Describe : Miller indices in detail.
- 6 Explain : Hexagonal closed packed structure.
- 7 Explain : metallic bond.
- 8 Explain : BCC crystal structure.
- 9 Explain BCS theory.
- 10 Give the application of superconductivity.
- 11 Explain London's theory in detail.
- 12 Explain in detail influence of external agents on superconductivity.