

(6 pages)

Reg. No. :

Code No. : 30565 E Sub. Code : SMPH 64

B.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2020.

Sixth Semester

Physics – Core

SOLID STATE PHYSICS

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. Which of the following has a HCP crystal structure?
 - (a) W
 - (b) Mo
 - (c) Cr
 - (d) Zr

2. The smallest portion of the lattice is known as
- (a) Lattice structure (b) Lattice point
 - (c) Bravais lattice (d) Unit cell
3. In which materials the magnetic anisotropy is followed?
- (a) Diamagnetic
 - (b) Paramagnetic
 - (c) Ferromagnetic
 - (d) Antiferromagnetic
4. The unit of relative permeability is
- (a) henry/metre (b) henry
 - (c) henry/sq.m (d) it is dimensionless
5. Covalent bond is also known as ————— bond.
- (a) Electrovalent (b) Electrolytic
 - (c) Heteropolar (d) Homopolar
6. Ionic bonds are
- (a) easy to break
 - (b) weak
 - (c) electrical bonds
 - (d) very difficult to break

7. The shifting of electrons in superconductors is prevented by
- (a) Quantum effect
 - (b) Threshold energy
 - (c) Energy barrier
 - (d) Orbitals
8. The soft superconductors observe
- (a) Meissner
 - (b) Silibee's rule
 - (c) Both (a) and (b)
 - (d) None of these
9. Carbon nano tubes are also called as
- (a) Bucky tubes
 - (b) Bulky tubes
 - (c) Buck balls
 - (d) Bulk tubes
10. The sol gel is a ————— of solid particle.
- (a) Sublimation
 - (b) Melting
 - (c) Cottridal suspension
 - (d) Cool down

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Describe simple cubic structure with a diagram.

Or

- (b) Write a note on reciprocal lattices.

12. (a) Write a note on ferromagnetism.

Or

- (b) Define the terms :

- (i) Dielectrics
- (ii) Polarization.

13. (a) Write a note on Covalent Bonding.

Or

- (b) Describe Cohesive energy.

14. (a) Define the terms :

- (i) Entropy
- (ii) Isotope effect.

Or

- (b) Distinguish between type I and Type II superconductors.

15. (a) Describe the synthesis of Nanomaterials.

Or

- (b) Describe the chemical vapour deposition.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Explain seven classes of crystals.

Or

- (b) Write the procedure for finding Miller indices.

17. (a) Explain the domain theory of ferromagnetism.

Or

- (b) Explain Space charge polarization.

18. (a) Explain bond theory of solids.

Or

- (b) Write the comparison between ionic and covalent solids.

19. (a) Describe the
(i) Meissner effect
(ii) Specific heat

Or

- (b) Explain high temperature superconductors.

20. (a) Explain sol gel technique.

Or

- (b) Outline the properties and application of Nanomaterials.
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