Avinashilingam Institute for Home Science and Higher Education for Women
Coimbatore – 641 043

Bachelor's Degree Examination – November 2017

V Semester

Class : III UG
Major : Physics

Time : 3 Hours
Max. Marks : 100

15BPHC15 / 14BPHC15 Solid State Physics

Part – A **10 x 1 = 10**

Choose the Correct Answer

1. The coordination number in the case of simple cubic crystal is
   a. 12 b. 6
   c. 2 d.1

2. Which of the following metals crystallize in FCC structure
   a. aluminium b. zinc
   c. sodium d. HALEOGEN

3. Lattice constant of fcc is
   a. $4r/\sqrt{2}$ b.4r
   c. 4r/5 d.24

4. Packing factor of simple cubic is of which percentage?
   a. 52 b. 72
   c. 92 d. 100

5. Transport properties of electrons in metals are explained by
   a. Drude Lorentz theory b. Weiss theory
   c. classical theory d. ionic theory

6. Hall effect is due to
   a. Nature of current in conductor b. flaws
   c. liquid d. protons

7. In order to express magnetic moment ,which factor is used?
   a. magnetron b. Bohr magnetron
   c. split factor d. Lande factor

8. Paramagnetism is due to the presence of
   a. paired electrons b. unpaired electrons
   c. pair of protons d. unpaired protons

9. Dielecric is an
   a. electrical wire b. electrical insulator
   c. coil d. transformer

10. Ability to store electrical energy is called
    a. dielectric constant b. resistance
    c. capacitance d. permeability

Part – B **5 x 6 = 30**

Answer the following

Answer should not exceed 400 words or two pages

11.a. Define and explain the terms in crystal structure study
1. Lattice 2.primittive cell 3. unit cell

(Or)

11.b Describe the different symmetry elements.

12.a. Discuss about the crystal structure of C_SCl_3

(Or)

12.b. Explain the structure of zinc blende.

13.a. Write short notes on effective mass in semiconductors.

(Or)

13.b. Discuss about Hall effect ,voltage and coefficient.

14.a. Compare electric spin and magnetic moment due to nuclear spin.

(Or)

14.b. Write short notes on ferromagnetism and spontaneous magnetization in ferromagnetic materials.

15.a. Explain about electronic and ionic polarisation.

(Or)

15.b. How will you evaluate the local field for cubic crystal structure?

Part – C **5 x 12 = 60**

Answer the following

Answer should not exceed 800 words or four pages

16.a. What are Bravais lattices? With suitable diagram discuss about Bravais lattices in two dimensions

(Or)

16.b. i)What are Miller indices ? How are they determined?
ii)compare the atomic radius ,packing factor of SC,FCC &BCC

17.a. Discuss about the structure of diamond.

(Or)

17.b. Explain about the structure of NaCl3.

18.a. State and prove Weidman Franz Law

(Or)

18.b. Describe Kronig penny model

19.a. Discuss the classical theory of diamagnetism

(Or)

19.b. Discuss about the concept of Langevin's theory of paramagnetism

20.a. Give Langevin's theory of polarization in polar dielectrics.

(Or)

20.b. Derive Clausius -Mossoti equation

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