

B.Sc. DEGREE EXAMINATION APRIL 2007
BRANCH III - PHYSICS
SIXTH SEMESTER

REG. No. _____

COURSE : MAJOR – CORE
PAPER : SOLID STATE PHYSICS
TIME : 30 MINS.

MAX. MARKS : 30

SECTION - A

TO BE ANSWERED IN THE QUESTION PAPER ITSELF

ANSWER ALL QUESTIONS: (30 x 1 = 30)

I CHOOSE THE CORRECT ANSWER:

- Which is the electronic configuration of chlorine ion (Cl^-) ?
a) $1S^2 2S^2 2p^6$ b) $1S^2 2S^2 2p^6 3S^2$ c) $1S^2 2S^2 2P^6 3S^2 3P^6$ d) none
- Bonding in Germanium is
a) ionic b) covalent c) metallic d) none
- The inter-atomic distance between carbon atoms in diamond is
a) 1.54 \AA b) 1.57 \AA c) 1.52 \AA d) 1.56 \AA
- A defect in which an atom or ion is found to be missing from its correct position is called
a) Frenkel b) line defect c) plane defect d) Schottky defect
- The colouration of the crystals is due to _____ in the crystals.
a) imperfection b) defects c) dislocation d) grain boundaries
- Motion of a dislocation is possible by a
a) climb b) slip c) glide d) all the above
- Hall co-efficient is
a) $R_H = -\frac{1}{ne}$ b) $R_H = \frac{1}{ne}$ c) $R_H = ne$ d) $R_H = -ne$
- For most metals resistivity is
a) $\rho \propto p$ b) $\rho = p$ c) $\rho \geq p$ d) $\rho \propto \frac{1}{p}$

9. One Bohr magneton is equal to
 a) 9.25×10^{-25} Amp-m³ b) 9.27×10^{-24} amp-m³
 c) 9.27×10^{-23} Amp-m³ d) 9.27×10^{-31} amp-m³
10. Ferromagnetics acquires a relatively high magnetization in
 a) strong fields b) electromagnetic fields
 c) weak fields d) none
11. Diamagnetic substances have
 a) Negative susceptibility b) Positive susceptibility
 c) Zero susceptibility d) All the above
12. In superconducting phase, the thermal conductivity of tin at 2K in Watts/cm K
 a) 34 b) 12 c) 18 d) 16
13. Below the Neel temperature, the anti parallel alignment of electron spins results in a phenomena called
 a) ferromagnet b) Ferrimagnet c) anti-ferromagnet d) ferrites
14. The electrical conductivity of the metal is
 a) high b) neither high nor low
 c) low d) either high or low
15. A hole trapped at a positive ion vacancy is called
 a) F-centre b) V-centre c) F'-centre d) impurity-atom

II FILL IN THE BLANKS:

16. The vander Waal's bonding is _____ than that of ionic bond.
17. Hall effect can be used to determine the _____ of the substance.
18. Ferrites are used as _____.
19. At Curie temperature, ferromagnet becomes _____.
20. In all superconductors, the entropy _____ on cooling below the critical temperature.

III STATE WHETHER TRUE OR FALSE:

21. Covalent bonds are strongly directional in character.
22. A boundary between two adjacent perfect regions in the same crystal which are slightly filled with respect to each other is called Grain boundaries.
23. In the superconducting state, resistivity tends towards zero.

24. $\nabla \times \bar{H} = -\frac{\partial \bar{B}}{\partial t}$.

25. Ferromagnets do not exhibit a linear proportionality between the magnetization and the field strength.

IV ANSWER IN ONE OR TWO SENTENCES:

26. Give any two characteristics of covalent bonds.

27. Define edge dislocation.

28. What is meant by Wiedemann-Franz ratio?

29. Define magnetic susceptibility?

30. What is Meissner effect?



