

**CHAPTER 17**  
**PHYSICS OF SOLIDS**

**1. Encircle the correct answers.**

- i.** An ordinary glass gradually softens into a paste like state before it becomes a very viscous liquid which is possible at:
- 900°C
  - 600°C
  - 800°C
  - 100°C
- ii.** The dimension of stress is:
- $[MLT^{-1}]$
  - $[ML^{-1}T]$
  - $[ML^{-1}T^{-1}]$
  - $[ML^{-1}T^{-2}]$
- iii.** The conductors having the conductivity of the order of:
- $10^{-4}(\Omega - m)^{-1}$
  - $10^7(\Omega m)^{-1}$
  - $10^{-10}(\Omega - m)^{-1}$
  - $10^{-7}(\Omega - m)^{-1}$
- iv.** The material whose resistivity becomes zero below a certain temperature:
- Conductors
  - Semi conductors
  - Super conductors
  - Insulators
- v.** Recently a complex crystalline structure known as yttrium barium copper oxide ( $Yb_a_2Cu_3O_3$ ) have reported to become super conductor at:
- 163 K
  - 169 K
  - 200 K
  - 100 K
- vi.** Curie temperature is:
- Different for chromium oxide and cobalt
  - Same for chromium oxide and cobalt
  - Same for iron and cobalt
  - None of these
- vii.** The curie temp for iron is about:
- 800°C
  - 740°C
  - 750°C
  - 650°C
- viii.** The domain theory of magnet is important to explain the behavior of:
- Diamagnets
  - Paramagnets
  - Ferromagnets
  - All of these
- ix.** At 300 K a piece of silicon is a:
- Conductor
  - Semi-conductor
  - Insulator
  - All
- x.** Coercive force is used to:
- Demagnetize the material
  - Magnetize the material
  - Extend it
  - None of these

- Define stress and strain. What are their SI units?
- Differentiate between tensile, compressive and shear modes of stress and strain.
- Define modulus of elasticity.
- Show that the units of modulus of elasticity and stress are the same. Also discuss its three kinds.
- What is meant by strain energy?
- Write a note on superconductors.
- What is meant by hysteresis loss? How is it used in the construction of a transformer?

**Note: Long questions:**

**Q.3 (a)** What are semi-conduction? How P-type and N-type materials are found?

**(b)** A 1.25 cm diameter cylinder is subjected to a load of 2500 Kg. Calculate the stress on the bar in mega pascals.

**Q.4 (a)** describe the magnetic properties of solid. Describe the types of magnets.

**(b)** A 1.0 m long copper wire is subjected to stretching force and its length increases by 20 cm. Calculate the tensile strain and the percent elongation which the wire undergoes.

**Q.2 Write the short answers.**

- i.** Distinguish between crystalline, amorphous and polymeric solids.