Instructions:

1. All Questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.
5. Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE: $2 \times 5 = 10$

(a) Define resistivity. State its unit.

(b) State any four dielectric materials.

(c) State the classification of magnetic material.

(d) Define intrinsic and extrinsic semiconductor.

(e) Define Thermonic emission.

(f) State the impurities for obtaining p-type and n-type semiconductor from intrinsic semi conductor. (2 each)

(g) Give the material composition for obtaining RED and yellow colour LED.
2. **Attempt any THREE:** \(4 \times 3 = 12\)

(a) Describe super conductivity. State its applications.

(b) Describe the concept of piezo electricity and state its applications.

(c) State the requirements of good insulating material.

(d) Describe the effects of temperature on conductivity of metals.

3. **Attempt any THREE:** \(4 \times 3 = 12\)

(a) State the materials used for fabrication of photo diode along with its justification.

(b) Describe the process of photo emission. State the application of photo emission in electronic components.

(c) Describe the principle of thermoelectric. State thermoelectric materials.

(d) Draw and explain hysteresis loop in magnetic material.

4. **Attempt any THREE:** \(4 \times 3 = 12\)

(a) Write one application for the given dielectric material.

   (i) Polyvinyl Carbide (PVC)

   (ii) Glass

   (iii) Mica

   (iv) Cotton and silk
(b) Explain the materials used in wearable antennas with their properties.

(c) Describe dielectric strength and dielectric constant with respect to dielectric materials.

(d) Explain the concept of anti ferro magnetism and state its significance.

(e) Define Electron mobility. State its significance in electronic components.

5. **Attempt any TWO** : \(6 \times 2 = 12\)

(a) State the different modes of electron emission in metal. Explain any two modes of emission.

(b) Define magnetic permeability. State and explain the factors affecting permeability of magnetic materials.

(c) Describe the concept of ferro electricity. Explain the application of ferro electric material.

6. **Attempt any TWO** : \(6 \times 2 = 12\)

(a) (i) Explain the process of diffusion in semiconductor material.

(ii) Explain Hall effect.

(b) Explain magnetostriction property. Explain generation of ultrasonic using magnetostriction.

(c) State any four materials used in fabrication of semiconductor device and describe its need.