22217

21819

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Assume suitable data, if necessary.
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **5 × 2 = 10**

(a) Define Superconductivity.
(b) Give any two properties of polymers.
(c) Give the classification of magnetic materials.
(d) Define intrinsic and extrinsic semiconductor.
(e) List any two applications of thermionic emission.
(f) Draw energy level diagram of conductor and insulator.
(g) State any four applications of micrometers.

2. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain the concept of field emission and give its two applications.
(b) Explain the requirements of good insulating material.
(c) Explain the concept of piezo-electricity and give its two applications.
(d) Explain seekback effect and give its two applications.

3. Attempt any THREE of the following : **3 × 4 = 12**

(a) Explain types of impurity added in a semiconductor with one example each.
(b) Give various photoemissive materials and suggest relevant combination of material for LED to emit Yellow and Green colour.
(c) State and explain various factors affecting the resistivity of electrical materials.
(d) Explain the concept of anti-ferromagnetism.

4. Attempt any THREE of the following : **3 × 4 = 12**

(a) Suggest the relevant materials used in flexible and wearable antenna.

(b) Explain the effect of a dielectric on the behaviour of a capacitor.

(c) Explain various factors that affecting the permeability.

(d) Explain the effect of temperature on the electrical conductivity of metal.

(e) Describe the breakdown in solid dielectric materials.

5. Attempt any TWO of the following : **2 × 6 = 12**

(a) Suggest suitable material for (i) Secondary emission (ii) Photoelectric emission and explain any one emission process. Give one application of each.

(b) State one application for the given dielectric material :

(i) Mica

(ii) Rubber

(iii) Cotton

(iv) Wood

(v) Polythene

(vi) Bakelite

(c) Draw and explain the typical magnetization curve for a ferromagnetic material. State the applications of ferromagnetic materials.

6. Attempt any TWO of the following : **2 × 6 = 12**

(a) Explain the following in brief :

(i) Diffusion

(ii) Hall effect

(iii) Thermal conductivity

(b) Explain the properties of magnetic materials with examples :

(i) Permanent magnetic dipole

(ii) Paramagnetism

(iii) Diamagnetism

(c) Explain the following materials used for fabrication of semiconductors :

(i) Substrata

(ii) Capacitance materials

(iii) Metals
