22217

12223

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

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 of the following : **10**

a) State the factors affecting the resistivity of metals.

b) Define piezoelectricity.

c) List any two magnetic materials.

d) List any types of semiconductors and state their applications.

e) Name any two superconductors.

f) Define drift and diffusion currents.

g) State any two photo emissive materials.

Marks

2. Attempt any THREE of the following : **12**

a) Explain superconductivity, its features and applications.

b) Explain the effects of frequency on the electronic polarizability.

c) Describe the breakdown in gaseous dielectrics.

d) Explain the concept of field emission.

3. Attempt any THREE of the following : **12**

a) Explain the effect of temperature on the conductivity of semi-conductor.

b) State the material used and application of micromotors.

c) State and explain thermoelectric effects.

d) Differentiate between anti-ferromagnetism and ferrimagnetism.

4. Attempt any THREE of the following : **12**

a) State the type and concept of electroluminance of LASER.

b) Explain the effect of a dielectric material on the behavior of a capacitor.

c) Give the classification of magnetic materials and explain any one.

d) Explain clearly the effect of temperature on electrical conductivity of metals.

e) State the characteristics of good insulating materials.

Marks

5. Attempt any TWO of the following : **12**

a) Suggest the suitable material for –

i) Field emission

ii) Secondary emission and explain any one emission process. Give one application of each.

b) Differentiate diamagnetic, paramagnetic and ferromagnetic materials. (any six points).

c) Write one applications for the given dielectric material.

i) Polyvinylcarboide

ii) Silk

iii) glass

iv) Bakelite

v) Porecilan

vi) mica

6. Attempt any TWO of the following : **12**

a) Draw energy band diagram for semi-conductor, conductor and insulator. Explain the N-type semi-conductor.

b) Classify the magnetic materials on the basis of presence or absence of permanent magnetic dipoles.

c) Describe Hall effect and state its applications.

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