22217

12425

03 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) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) 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) Define Mobility and state its unit.

b) State any two Piezoelectric Material.

c) Define Magnetic Dipole.

d) Define Donor impurity and Acceptor impurity.

e) State any two application of photoelectric effect.

f) Define Forbidden Energy band.

g) State various material used to produce LASER.

Marks

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

a) State and explain various factors affecting the resistivity of Electrical Materials.

b) State any two application of following material

i) Transformer Oil

ii) PVC

iii) Polythene

iv) Bakelite

c) Explain the breakdown in gaseous Dielectrics.

d) Explain the concept of field emission.

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

a) Explain Hall effect with diagram and state two application of Hall effect.

b) Explain construction and operation of Piezoelectric Micromotor.

c) Explain peltier effect. State its applications.

d) Draw and Explain Eddy current loss.

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

a) Draw and explain Light Sensitive Relay.

b) What are the requirement of good Insulating Material.

c) Draw and explain the typical Magnetization curve for Ferromagnetic Material.

d) Find the resistivity and conductivity of copper rod whose resistance is 0.03Ω, length is 1.5m and cross sectional area is $1mm^2$.

e) State the important characteristics, types and application of polymers.

Marks

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

a) Explain the super conductivity and state its features and applications.

b) Compare Diamagnetic, Paramagnetic and Ferromagnetic material on following parameters:

i) Parmanent dipoles

ii) Orientation of dipoles

iii) Distortion of magnetic field

iv) Force exerted by magnetic field

v) Arrangement of dipole moments

vi) Relative permeability

c) Explain the concept ferroelectricity. Write example and application of ferroelectricity.

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

a) Draw and explain Energy band diagram of Conductor, Semiconductor and Insulator.

b) Define Magnetic permeability. State and Explain the factors affecting permeability of magnetic material.

c) Explain thermal conductivity and coefficient of thermal conductivity in semiconductor material.

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