22217

21222

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

15 minutes extra for each hour

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) List factors affecting resistivity of electric materials.

b) What is piezoelectricity ?

c) List any four dielectric materials.

d) Define the term 'Permeability'. State its unit.

e) List any two magnetic materials.

f) 'Trivalent impurity materials are called as Acceptor impurity'. Justify your answer.

g) Define Electroluminesence.

Marks

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

a) State the requirements of good insulating material.

b) Explain the concept of anti-ferromagnetism with neat diagram.

c) Sketch energy band diagram of conducting and insulating material and lable it well.

d) Explain the principle of stimulated emission and radiation in LASER.

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

a) Describe the principle of thermoelectric. State thermoelectric materials.

b) Describe dielectric strength and dielectric constant with respect to dielectric materials.

c) Explain how energy levels are formed in a material.

d) List any four photoemissive materials. State features of any one of them.

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

a) Define electron mobility. State it's significance in electronic components.

b) Explain seebeck effect and give it's two applications.

c) Explain the concept of magnetostriction effect and state it's applications.

d) Compare P-Type and N-Type semiconductor materials using following points.

(i) Impurities used.

(ii) Majority carriers.

(iii) Bands in which conduction takes place.

(iv) Minority Carriers.

e) Explain diffusion (current) in a semiconductor.

Marks

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

a) Explain superconductivity and give any four applications of it.

b) Classify liquid dielectric material and explain breakdown in liquid dielectric materials.

c) Explain the properties of magnetic materials with examples:

(i) Ferromagnetism

(ii) Paramagnetism

(iii) Diamagnetism

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

a) State the different modes of electron emission in metal. Explain any one mode of emission.

b) Write one application for the given dielectric materials.

(i) Mica

(ii) PVC

(iii) Polythene

(iv) Glass

(v) Rubber

(vi) Cotton

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

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