



Printed Pages : 4

TEE - 403

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2053

Roll No.

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B. Tech.

(SEM. IV) EXAMINATION, 2008-09

ELECTRICALS &

ELECTRONICS ENGINEERING MATERIALS

Time : 3 Hours]

[Total Marks : 100

- Note :
- (1) Attempt all questions
 - (2) All questions carry equal marks.

1 Attempt any **four** parts of the following : 5×4

(a) Explain briefly the following :

(i) Body centered cubic structure (BCC)

(ii) Face centered cubic structure (FCC)

(b) Explain with suitable examples the ionic, covalent and metallic bonding in crystals.

(c) Describe edge and screw dislocations.

(d) A beam of X-rays of wavelength 0.842\AA is incident on a crystal at a grazing angle $8^{\circ}-35'$ when the first order Bragg's reflection occurs. Calculate the angle of incidence for third order reflection.



(e) What is Millar Indices? Describe the procedure for finding it with an example.

(f) Show that for a simple cubic system :

$$d_{100} : d_{110} : d_{111} :: \sqrt{6} : \sqrt{3} : \sqrt{2} .$$

2 Attempt any **four** parts of the following : 5×4

(a) Explain zone theory of solids

(b) Explain superconductivity. Describe briefly the properties of superconductors.

(c) What is electrical conductivity? Enlist the factors affecting the electrical conductivity of metals.

(d) Derive an expression for heat developed in a current carrying conductor.

(e) A resistance wire of 1 metre length and diameter 0.08 mm has a resistance of 95.5 ohm. Calculate the resistivity of the wire material.

(f) Explain thermal conductivity and obtain an expression for coefficient of thermal conductivity.

3 Attempt any **two** parts of the following : 10×2

(a) What do you understand by the term dielectric loss and loss angle? How do loss factor and dielectric constant vary with temperature and frequency of an alternating field? Explain.



- (b) (i) Describe hysteresis loop of a magnetic material and explain residual magnetism and coercive force.
- (ii) Explain the phenomenon of magnetostriction.
- (c) (i) State the relative advantages and disadvantages of aluminium as compared to copper as a conductor of electricity.
- (ii) How do you classify the materials as dia, para or ferromagnetic?
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