

Printed Pages : 2

EEE403

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

**PAPER ID : 0209**

Roll No.

|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|

**B.Tech.****(SEMESTER-IV) THEORY EXAMINATION, 2011-12****ELECTRICAL & ELECTRONICS ENGINEERING MATERIALS****Time : 3 Hours ]****[ Total Marks : 100****Note :** Attempt **all** questions directed.**Section – A**1. Answer **all** the questions (in **50 – 75** words) :**10 × 2 = 20**

- Define atomic packing factor.
- Define coordination number.
- What is doping ?
- Draw the symbol of P-N junction diode.
- Define peltier effect.
- Define stress and strain.
- Define magnetic permeability.
- Define magnetostriction.
- What are miller indices ?
- Write continuity equation.

**Section – B**2. Answer **three** questions out of 5 :**3 × 10 = 30**

- State and explain Bragg's Law.
  - X-rays of wavelength  $1.5418 \text{ \AA}$  are diffracted by (111) planes in a crystal at an angle  $30^\circ$  in the first order. Calculate interatomic spacing..
- What are the factors affecting electrical resistance of materials ?
  - Write in detail about seebeck effect.
- Explain Hall effect and its importance.
  - Write about properties of semiconducting materials.
- How materials are classified as dia or para or ferro-magnetic ? Explain.
- Write in detail about classification of materials using energy band.

0209

1

**P.T.O.**

**Section – C**

Answer any **one** question with internal choice :

**5 × 10 = 50**

3. Write in detail about bonds in solids.

**OR**

NaCl crystal has F.C.C. structure. The density of NaCl is  $2.18 \text{ g/cm}^3$ . Calculate the distance between two adjacent atoms.

4. Write the properties and applications of electrical conducting and insulating materials.

**OR**

Explain in detail about thermoelectric effect.

5. Distinguish between intrinsic and extrinsic semiconductors with suitable example.

**OR**

What happens when a P-N junction is biased in :

- (i) Forward direction ?
- (ii) Backward direction ?

6. Draw the B-H curve for a ferromagnetic material and identify the retentivity and the coercive field on the curve and explain their importance.

**OR**

What are the characteristics of soft magnetic materials ?

7. With the help of neat sketches and characteristic curves explain the operation of the junction FET.

**OR**

Explain the operation of NPN and PNP transistors.

---