12+2=14+10=24.

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**
   - (a) Define atomic packing factor.
   - (b) Define coordination number.
   - (c) What is doping ?
   - (d) Draw the symbol of P-N junction diode.
   - (e) Define peltier effect.
   - (f) Define stress and strain.
   - (g) Define magnetic permeability.
   - (h) Define magnetostriction.
   - (i) What are miller indices ?
   - (j) Write continuity equation.

Section – B

2. Answer **three** questions out of 5 : **3 × 10 = 30**
   - (a) (i) State and explain Bragg's Law.
     (ii) X-rays of wavelength 1.5418 Å are diffracted by (111) planes in a crystal at an angle 30° in the first order. Calculate interatomic spacing..
   - (b) (i) What are the factors affecting electrical resistance of materials ?
     (ii) Write in detail about seebeck effect.
   - (c) (i) Explain Hall effect and its importance.
     (ii) Write about properties of semiconducting materials.
   - (d) How materials are classified as dia or para or ferro-magnetic ? Explain.
   - (e) Write in detail about classification of materials using energy band.

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 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.
