DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

00971

Term-End Examination
December, 2012

OIEE-002 : ELECTRICAL ENGINEERING MATERIAL

Time : 2 hours   *Maximum Marks : 70*

Note :   *All questions carry* **equal** *marks. Q. No* **1** *is compulsory. Attempt* **any four** *question out of Q. No* **02** *to 08*

Choose the correct alternative which answers the questions given below correctly.   **7x2=14**

1.   (a)   Which of the following is not an example of electrical engineering material ?

(i)   super conductor

(ii)   mica and ferite

(iii) cermet

(iv)   aluminium doped silicon

(b)   The value of wave number may be :

(i)   zero   (ii)   positive

(iii) negative   (iv)   all the above

(c) In an imperfection free crystal, the resistivity will be :

(i) infinite   (ii) zero

(iii) negative   (iv) unity

(d) Diplacement current in a dielectric primarily depends upon the :

(i) resistivity

(ii) dipole moment

(iii) frequency of operating field

(iv) mobility

(e) Piezo-electricity has been observed in :

(i) nickel   (ii) glass

(iii) quartz   (iv) mica

(f) Line insulators are mode of :

(i) porcelain   (ii) mica

(iii) marble   (iv) PVC

(g) The poles of alternators are usually made of :

(i) wrought iron   (ii) permalloy

(iii) cds   (iv) alnico

2. (a) Discuss the significance of bond energy of solids. Derive its expression relating the bonding force.   7

    (b) Discuss 'hydrogen bond', and bond in 'hydrogen'.   7

3. Classify solids on the basis of energy gaps in them. **14** Name them and compare their conductivity ranges, properties and characteristics.

4. Classify dielectric materials and quote examples **14** of each type. How do solid, liquid and gaseous dielectric compare with each other ?

5. (a) What is spontaneous polarization ? Draw **7** a polarization curve and a hysteresis loop, and explain their salient features.

   (b) What do you understand by Bubb'le theory **7** in relation to dielectric breakdown ?

6. What insulating material would you select for the following ? Mention the reasons. **2x7=14**
   (a) Flexible wire
   (b) Heating elements in an oven
   (c) Commutator in D.C. machine
   (d) Electric iron
   (e) Fuse-holder
   (f) Switch for domestic purposes
   (g) Distribution board.

7. Classify magnetic materials. Write examples, **14** salient features and applications of each of them.

8. Write short notes on *any four* of the following.
   (a) Bond length and bond energy.   **4x3.5=14**
   (b) Mean free path.
   (c) Dielectric break down in liquids.
   (d) Non dipolar solids.
   (e) Effect of moisture on insulating system.
   (f) Magnetic resonance.

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