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No. of Printed Pages : 3

OIEE-002

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

Term-End Examination

December, 2015

OIEE-002 : ELECTRICAL ENGINEERING MATERIALS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Use of scientific calculator is allowed.*

1. (a) Define superconductivity.

(b) What is resistivity ?

(c) Define electron ionization constant.

(d) What is hysteresis loss ?

(e) What is the difference between permanent magnet and electromagnet ?

(f) What do you understand by mean free path in a conductive material ?

(g) Name any two theories used to explain the breakdown in liquids. *7×2=14*

2. (a) How are engineering materials classified? Explain in detail. 7

(b) Discuss the energy bond in an engineering material. 7

3. (a) Define Ohm's law. Give expression of Ohm's law and draw V – I characteristic of a resistive material. *2+2+3=* 7

(b) With the help of the theory of Von-Hippel, explain the dielectric breakdown of solids. 7

4. (a) With the help of suitable diagrams explain in detail the breakdown in a liquid dielectric. 7

(b) Discuss the dielectric properties in an alternating field. Briefly explain the complex dielectric constant of non-dipolar solids. *4+3=7*

5. (a) What are the properties of a good insulating material ? What are the factors that affect the life of an insulating material ? *3+4=7*

(b) How is insulation of a material measured ? Explain in brief the effect of moisture on an insulating system. *4+3=7*

6. (a) Explain the magnetization and demagnetization of a ferromagnetic material. 7

(b) Discuss the factors affecting permeability and hysteresis loss. 7

7. Write short notes on any ***two*** of the following : *2×7=14*

(a) Relaxation, collision time and mean free path

(b) Insulating material for electronic equipment

(c) Magnetostriction phenomenon