No. of Printed Pages : 3

OIEE-002

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

Term-End Examination

00376

June, 2016

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) Name any two factors responsible for decay in an insulating system.

(b) Define relaxation time in case of movement of electrons in a conductive material.

(c) Define second ionization coefficient in dielectric breakdown in gases.

(d) Give any two properties of a ferromagnetic material.

(e) Name any two theories used to explain the dielectric breakdown of solids.

(f) State what do you mean by superconductivity.

(g) What is the difference between a dielectric and an insulator ? *7×2=14*

2. (a) Define and explain relaxation time, collision time and mean free path of electrons in a conductive material. 7

(b) Explain how heat is developed in a current carrying conductor and define thermal conductivity of metals. 4+3

3. (a) With the help of a neat diagram, explain the dielectric breakdown in liquids, according to colloidal theory. 7

(b) Define secondary ionization coefficient and explain Townsend's criterion with the help of a neat sketch and suitable expressions. 2+5

4. (a) What are the various factors that influence the characteristics of an insulating system ? Discuss them in brief. 7

(b) Explain ionic polarization as a function of frequency. Define the term ionic polarization. 5+2

5. (a) Compare paramagnetic materials with ferromagnetic materials. Draw and explain a typical hysteresis curve for a ferromagnetic material. 4+3

(b) Give a detailed classification of magnetic materials and discuss the origin of permanent magnetic dipole. *5+2*

6. (a) Explain the thermal discharge breakdown of a solid dielectric material with the help of a suitable diagram. *7*

(b) Explain magnetic resonance and its significance with the help of a suitable sketch. *7*

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

(a) Energy Band Description

(b) Dielectric Losses

(c) Insulation Measurement