Roll No. ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

B.E / B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV / DEC 2011

Electrical and Electronics Engineering Branch

SECOND SEMESTER

PH 9167 - PHYSICS OF ELECTRICAL & ELECTRONIC MATERIALS

(REGULATIONS 2008)

Time : 3 Hrs   Max. Mark : 100

Answer ALL Questions

PART - A (10 x 2 = 20 Marks)

1. Define electrical conductivity.

2. Define mean free path.

3. Explain the concept of holes in semiconductors.

4. How are n-type and p-type semiconductors produced?

5. What is electronic polarisation?

6. What are the applications of dielectrics?

7. What is meant by hysteresis loss?

8. What is Meissner effect?

9. Explain electro optical effect.

10. Define the terms phosphorescence and fluorescence.

PART - B (16 x 5 = 80 Marks)

11. On the basis of free electron theory derive an expression for the electrical conductivity.

12.(a) Derive an expression for the density of electrons in an intrinsic semiconductors.

(OR)

(b) Derive an expression for the carrier concentration in N-type semiconductor.

p.t.o.

13.(a) Derive the Clausius-Mosotti equation and explain its use in predicting the dielectric

constant of solids.

(OR)

(b) Discuss in detail the different types of polarization in dielectrics.

14.(a) Give a detailed account of Weiss theory of ferromagnetism.

(OR)

(b) What is superconductivity? What are the applications? What is the principle of magnetic

levilation?

15.(a) Explain the theory and working of LCD. What are the different types? Explain the

advantages.

(OR)

(b) Explain the principle and working of LED with suitable band diagram.