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Question Paper Code : 57035

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2014.

Second Semester

Civil Engineering

PH 6251 — ENGINEERING PHYSICS — II

(Common to all branches except Biotechnology and Pharmaceutical Technology)

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define drift velocity.
2. What are the sources of resistance in metals?
3. State the properties of a semiconductor.
4. What is meant by the law of mass action in semiconductor.
5. Give Curie-Weiss law and its importance.
6. What is meant by hysteresis loop and what do you infer from it?
7. What are dielectric materials? Give their properties.
8. Distinguish Lorentz force and Coulomb force in dielectrics.
9. What do you understand by the term quenching?
10. List out the various forms of carbon nano tubes.

PART B — (5 × 16 = 80 marks)

11. (a) Derive expressions for electrical and thermal conductivities on the basis of classical free electron theory and deduce the value of Lorentz number. (16)

Or

- (b) Derive an expression for density of states in a metal and hence obtain the Fermi energy in terms of density of free electrons. (16)

12. (a) Derive expressions for the carrier concentration in an intrinsic semiconductor. (16)

Or

- (b) What is Hall effect and give its origin? Describe an experiment for the measurement of the Hall coefficient and Hall Voltage. (4 + 12)

13. (a) (i) Discuss the domain structure in ferromagnetic materials. Show how hysteresis curve is explained on the basis of domain theory. (10)

- (ii) Differentiate soft and hard magnetic materials. (6)

Or

- (b) (i) Explain Meissner effect. How it is used to classify the Type-I and Type-II superconductors? (8)

- (ii) Write short notes on SQUID and magnetic levitation. (8)

14. (a) What is meant by local field in dielectric? Deduce Clausius-Mosotti equation. (16)

Or

- (b) What is dielectric breakdown? Write in detail about the various factors contributing to breakdown in dielectrics. (2 + 14)

15. (a) Give an account on Shape Memory Alloys (SMA) and their applications. (10 + 6)

Or

- (b) What is meant by CNT? Describe any three methods for producing nano-tubes. (4 + 12)