



Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

28/11
AN

Question Paper Code : 53082

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Second Semester
Civil Engineering
PH 2161 – ENGINEERING PHYSICS – II
(Common to all Branches)
(Regulations 2008)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10×2=20 Marks)

1. State Wiedemann-Franz Law.
2. At zero Kelvin temperature, what is the value of Fermi function at (i) $E = 0$ and at (ii) $E = E_F$.
3. The hole concentration of a semiconductor is increased by 20% from its intrinsic value. Obtain the resultant electron concentration with respect to the value of intrinsic concentration.
4. What are the advantages of compound semiconductors ?
5. What is Bohr magneton ? Write an expression for it.
6. What is cryotron ?
7. What is the relation between dielectric constant and dielectric susceptibility ? Mention its limits.
8. Mention the applications of dielectric materials.
9. Mention the applications of metallic glasses.
10. What is known as the size effect of nanoparticles ?



11. a) Derive expressions for electrical conductivity and thermal conductivity of a metal. (8+8)
- (OR)
- b) Define density of states of electrons and derive an expression for it. Mention its uses. (14+2)
12. a) Derive expressions for the electron and hole concentrations of an intrinsic semiconductor. Hence deduce the law of mass action of semiconductors. (6+6+4)
- (OR)
- b) What is Hall effect? Derive an expression for the Hall coefficient of a material and list the applications of Hall effect. (2+12+2)
13. a) i) Explain the property of magnetic hysteresis and classify hard and soft magnetic materials based on the nature of hysteresis loop. (8)
- ii) Discuss the domain theory of ferromagnetism. (8)
- (OR)
- b) i) Explain the properties of Type – I and Type – II superconductors. (8)
- ii) Discuss qualitatively the BCS theory of superconductors. (8)
14. a) Derive expressions for the different types of polarizations of dielectric media. (16)
- (OR)
- b) Derive an expression for the internal field of a dielectric and hence deduce the Clausius-Mossotti equation. (16)
15. a) Explain in detail the thermoelastic and super-elastic properties of SMA materials. (16)
- (OR)
- b) i) Discuss one top-down and one bottom-up methods of preparation of nanoparticles. (8)
- ii) Discuss the properties of carbon nanotubes and list their applications. (8)
-