



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PHYSICS

FIFTH SEMESTER – NOVEMBER 2017

PH 5508 / PH 5505 – ELECTRICITY & MAGNETISM

Date: 06-11-2017

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

PART A (10X 2 = 20)

Answer ALL questions.

1. State Gauss's law in electrostatics.
2. Define capacitance of a conductor.
3. Define Peltier effect.
4. State Faraday's laws of electrolysis.
5. State Lenz's law.
6. The successive throws on the same side of the mean position for an oscillating coil are 25, 24.9, 24.8 cm. Calculate the logarithmic decrement.
7. Define time constant of an L – R circuit.
8. A capacitor is charged by DC supply through a resistance of 2 mega ohms. If it takes 0.5 seconds for the charge to reach three quarters of its final value, calculate the capacitance of the capacitor.
9. Define magnetic permeability.
10. Give the expression for speed of light connecting permeability and permittivity of free space.

PART B (4 x7.5 = 30)

Answer any FOUR questions.

11. Obtain an expression for loss of energy on sharing of charges between two capacitors.
12. Explain how the specific resistance of the material of a wire is determined using Carey-Foster's bridge.
13. Obtain an expression for the force on a current carrying conductor placed in a magnetic field.
14. Obtain an expression for growth of charge of a capacitor through a resistor.
15. Explain domain theory of ferromagnetism.

PART C 4 x 12.5 = 50)

Answer any FOUR questions.

16. Define electric dipole and electric dipole moment. Derive expressions for the electric field at a point on the (a) Axial line and (b) equatorial line due to an electric dipole. .
17. What is thermo-electric diagram? Show how Peltier and Thomson emf's, neutral temperature and the temperature of inversion can be determined using this diagram.
18. Discuss the theory of Helmholtz galvanometer.
19. Explain decay of charge in LCR circuit. Deduce the conditions under which the discharge is oscillatory.
20. Discuss Langevin's theory of dia magnetism.
