# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **PHYSICS**

FIFTH SEMESTER – **NOVEMBER 2016**

**PH 5512 – ELECTRICITY AND MAGNETISM**

Date: 03-11-2016 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

**PART-A**

Answer **ALL** questions **(10 x 2 =20 marks)**

1. Define electric dipole moment of a electric dipole.
2. State Gauss's law.
3. With proper diagram define Peltier effect.
4. State Kirchoff's laws of current electricity.
5. State Biot – savart law.
6. Define Faraday's laws of electromagnetic induction.
7. Write the difference between series and parallel resonant circuit.
8. Write any two uses of transformer.
9. Define magnetic induction (B) and magnetization (M).
10. An iron rod 0.2 m long, 10 mm in diameter and of relative permeability 1000 is placed inside a long solenoid wound with 300 turns/metre. If a current of 0.5 amp is passed through the rod, find the magnetic moment of the rod.

**PART –B**

Answer any **FOUR** questions **(4 x 7.5 =30 marks)**

11. Derive Claussius-Mossotti equation.
12. Explain how thermo electric diagram is used in the determination of Peltier and Thomson emf.
13. Obtain an expression for the force on a current carrying conductor placed in a magnetic field.
14. Obtain an expression for the growth and decay of charge in a capacitor through a resistance.
15. Write the importance of hysteresis curve.
16. Enumerate the properties of Para and Diamagnetic materials.

**PART -C**

Answer any **FOUR** questions **(4x12.5=50 marks)**

17. a) Obtain an expression for the capacitance of a capacitor outer sphere is earth connected. (7)
    b) Obtain an expression for the capacitance of a parallel plate capacitor. (5.5)
18. Explain the electrical conductivity of a metal on Drude-Lawrence theory and obtain from it ohm's law. What is Wiedemann-Franz law? (12.5)
19. Describe the construction and working moving coil galvanometer. Obtain charge and current sensitivity, with damping corrections. (12.5)
20. Obtain an expression for the growth and decay of current in a L.C.R circuit. (12.5)
21. Discuss Langevins theory of Diamagnetism (12.5)
22. Discuss the principle and theory of series resonance circuit. (12.5)
23. a) Define pointing vector. (2)
    b) Deduce the equation for the propagation of the plane electromagnetic waves in free space. (10.5)

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