LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

FIFTH SEMESTER – **APRIL 2016**

PH 5508/PH 5505/PH 4500 – ELECTRICITY & MAGNETISM

Date: 30-04-2016 Dept. No. Max. : 100 Marks

Time: 09:00-12:00

PART-A

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

1. State Coulomb's law in electrostatics.
2. What is an electric dipole and write the expression for dipole moment.
3. Define the term thermoelectric power & write its units.
4. Define seeback effect.
5. State Ampere's Circuital law.
6. Write the conditions for a moving coil galvanometer to be a dead beat.
7. Define the terms peak value and mean value of alternating current.
8. Write the advantages of 3-phase system.
9. Write any two properties of ferromagnetic materials.
10. Write Maxwell's equations.

PART –B

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

11. A dipole consisting of an electron and proton 4x 10^{-10} m apart. Compute the electric field at a distance of 2x 10^{-8} m on a line from the centre of the dipole making an angle of 45° with its axis.
12. Describe the construction and working of Lead acid accumulator.
13. With a neat sketch explain the theory of Helmholtz Tangent galvanometer.
14. Explain in detail, the construction and working of choke coil.
15. With the help of Maxwell's equation show that electromagnetic waves are transverse in nature.

PART -C

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

16. a) State and prove Gauss's law.
    (i) For a charge inside the closed surface. (ii) For a charge outside the closed surface. (7.5)

    b) Derive an electric field due to an infinite plane sheet of charge. (5)

17. a) Explain with necessary theory how a carry Foster bridge may be used to compare two nearly equal resistance and hence determine the temperature co-efficient of resistance. (7.5)

    b) What is the difference between Peltier and Joule effect? (5)

18. a) Describe the construction and working moving coil galvanometer. Obtain charge and current sensitivity. (9)

    b) Explain Damping correction. (3.5)

19. Obtain an expression for the growth of L.C.R circuit and determine the necessary equation for damped oscillations. (12.5)

20. Discuss Langevin's theory of Diamagnetism. (12.5)

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