



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – PHYSICS

FIFTH SEMESTER – NOVEMBER 2016

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

Date: 03-11-2016

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

PART –A

Answer ALL questions:

(10x2 =20 marks)

1. Give the relation between electric potential and electric intensity.
2. Define capacitance of a capacitor?
3. State Kirchhoff's laws.
4. State the Faraday's laws of electrolysis.
5. Give the advantage of Helmholtz galvanometer than the tangent galvanometer.
6. Find the Lorentz force for a charge moving at right angles to the magnetic field.
7. Write the condition for the charge to be oscillatory in an LCR circuit.
8. Why series resonant circuit is called as an acceptor circuit?
9. Mention the uses of vibration magnetometer.
10. Explain coercivity and retentivity.

PART –B

Answer any FOUR questions:

(4x7.5 =30 marks)

11. What is an electric dipole? Obtain an expression for the potential at any point due to a dipole. (2+5.5)
12. Define Thomson coefficient. Explain the thermo electric diagrams. (2+5.5)
13. What is meant by coefficient of coupling? Obtain an expression for the coefficient of coupling between two coils. (2+5.5)
14. Explain the growth of charge in a circuit containing resistance and capacitance. Write a note on time constant of CR circuit. (5.5+2)
15. Distinguish between dia, para and ferro magnetic materials. Give an example for each. (6+1.5)

PART – C

Answer any FOUR questions:

(4x12.5 =50 marks)

16. Calculate the capacitance of a capacitor consisting of two concentric spheres when (i) the outer sphere is charged and the outer sphere is earthed, (ii) the inner sphere is charged and the inner sphere is earthed. (6.5+6)
17. a) Describe the Kohlrausch bridge experiment to determine the specific conductivity of an electrolyte.
b) Explain the construction and working of Daniel cell. (7+5.5)

18. Explain the principle, theory and construction of moving coil ballistic galvanometer. Also write notes on damping correction. (9+3.5)
19. Discuss the phenomenon of resonance in series LCR circuit. (12.5)
20. Deduce the equation for the propagation of the plane electromagnetic waves in free space and determine the velocity of light in free space. Define poynting vector. (10.5+2)

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