

I.M PRACTICE PAPER [CLASS 12th]

Unit 1 to 4

Time : 2hr

1 Marks Questions:

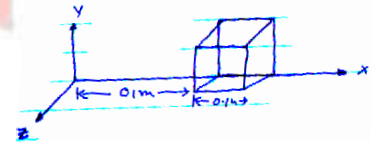
1. Why is a current not possible, without the source of emf?
2. How does a current loop behave like a magnetic dipole?
3. Which material is used to make electromagnet and why?
4. Define the term 'mobility' of charge carriers. Write its S.I unit
5. In a series LCR circuit, $V_L = V_C \neq V_R$. What is the value of power factor?
6. Explain, how moving charge is a source of magnetic field.
7. What is meant by wattless current?

2 Marks Questions

9. Keeping the voltage of the charging source constant, what would be the %age change in energy stored in a parallel plate capacitor, if the separation b/w the plates were to be decreased by 10%?
10. Two point charges $20 \mu C$ and $-4 \mu C$ are placed at a distance 50cm in air (i) find the point on the line joining where potential is zero (ii) also find electrostatic potential energy of the system?
11. A circular coil having 20 turns, each of radius 8cm is rotating about its vertical diameter with an angular velocity of 50 rad s^{-1} in a horizontal magnetic field of 30 mT. Obtain the maximum average and rms values of the emf induced in the coil, if the coil form a closed loop of resistance 10Ω , How much power is dissipated as heat in it?
12. Two identical charge particles moving with same speed enter a region of uniform magnetic field. If one of these enters normal to the field direction and other enter along a direction at 30° with the field. What would be the ratio of their angular frequencies? 2
13. An alternating voltage given by $v = 140 \sin 314 t$ is connected across a pure resistor of 50Ω Find (i) frequency source (ii) rms value of current? 2
14. Calculate the resistivity of a material of wire 1m long, 0.4 mm in diameter and having a resistance of 2Ω ?
15. What is the cause of conduction current?
16. What is the area of the plate of a 2F parallel plate air capacitor, given that the separation between the plates is 0.5 cm?
17. If 3.2×10^{17} electrons pass through a wire in 0.5 sec, calculate the current through it. Also find value of current in μA ?
18. What are dia, para and ferro magnetic materials?

3 Marks questions:

19. (i) Define electric flux write its SI unit
(ii) The electric field components due to a charge inside the cube of side .1m are shown in fig
 $E_x = \alpha x$, where $\alpha = 500 N / c$, $E_y = 0$, $E_z = 0$ find electric flux? 3
20. A slab of material of dielectric constant K has the same area as that of the plates of a parallel plate capacitor but has the thickness $d/2$, where d is the separation b/w the plates. Find out the expression for its capacitance when the slab is inserted between the plates of the capacitor? 3
21. (a) State with the help of a circuit diagram, the working principle of a meter bridge. Obtain the expression used for determine the unknown resistance
(b) What happens of the galvanometer And cell are interchanged at the balance point of the bridge (why is it considered important to obtain the balance point near the mid point of the wire) ? 3
22. Obtain an expression for energy stored in a solenoid. How is this magnetic energy per unit volume compared with electrostatic energy per unit volume in a capacitor? 3
23. Derive an expression for torque acting on a bar magnet held at an angle with the direction of a uniform magnetic field.
24. What is meant by mean value of a.c? Derive an expression for mean value of alternating current?



5 Marks questions

25. Explain the construction, working and principle of cyclotron. Show mathematically. that the cyclotron frequency close not depend upon the speed of the particle
26. Find the relation for impedance of L R C circuit? And then define resonance frequency? 5
27. Deduce the expression for the electrostatic energy stored in a capacitor of capacitance C and having charge q? How will the (i) energy stored and (ii) the electric field inside the capacitor be affected when it is completely filled with a dielectric material of dielectric constant 'K'?

