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XII- PHYSICS
Important questions

UNIT- 1:ELECTROSTATICS

Short Answer Questions

1. What is meant by quantisation of charges?

6. What is mean by 'electric field lines'?

7. The electric field lines never intersect. Justify.

8. Define 'electric dipole'. Give the expression for the magnitude of its electric dipole moment and the direction.

10. Define 'electrostatic potential".

11. What is an equipotential surface?

12. What are the properties of an equipotential surface?

15. Define 'electric flux'.

17. Write a short note on 'electrostatic shielding'.

18. What is polarisation?

19. What is dielectric strength?

20. Define 'capacitance'. Give its unit.

21. What is corona discharge?

Long Answer questions

1. Discuss the basic properties of electric charges.

4. Calculate the electric field due to a dipole on its axial line and equatorial plane.

5. Derive an expression for the torque experienced by a dipole due to a uniform electric field.

7. Derive an expression for electrostatic potential due to an electric dipole.

11. Obtain the expression for electric field due to an infinitely long charged wire.

12. Obtain the expression for electric field due to an charged infinite plane sheet.

17. Obtain the expression for capacitance for a parallel plate capacitor.

18. Obtain the expression for energy stored in the parallel plate capacitor.

20. Derive the expression for resultant capacitance, when capacitors are connected in series and in parallel.

22. Explain in detail the construction and working of a Van de Graaff generator.

UNIT 2: CURRENT ELECTRICITY

Short Answer Questions

1. Why current is a scalar?

2. Define current density.

3. Distinguish between drift velocity and mobility.

6. What are ohmic and non ohmic devices?

7. Define electrical resistivity.

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8. Define temperature coefficient of resistance.

9. Write a short note on superconductors?

15. State the principle of potentiometer.

16. What do you mean by internal resistance of a cell?

17. State Joule's law of heating.

18. What is Seebeck effect?

19. What is Thomson effect?

20. What is Peltier effect?

21. State the applications of Seebeck effect.

Long Answer Questions

3. Explain the equivalent resistance of a series and parallel resistor network.

4. Explain the determination of the internal resistance of a cell using voltmeter.

6. Obtain the condition for bridge balance in Wheatstone's bridge.

8. How the emf of two cells are compared using potentiometer?

UNIT 3: MAGNETISM AND MAGNETIC EFFECTS OF ELECTRIC CURRENT

Short answer questions:

3. Define magnetic dipole moment.

4. State Coulomb's inverse law.

6. State Biot-Savart's law.

10. What is meant by hysteresis?

13. Define ampere.

14. State Fleming's left hand rule.

15. Is an ammeter connected in series or parallel in a circuit? Why?

18. Give the properties of dia / para / ferromagnetic materials.

20. How is a galvanometer converted into (i) an ammeter and (ii) a voltmeter?

Long answer questions

2. Deduce the relation for the magnetic field at a point due to an infinitely long straight conductor carrying current using Biot-Savart law.

3. Obtain a relation for the magnetic field at a point along the axis of a circular coil carrying current using Biot-Savart law.

11. Discuss the conversion of galvanometer into a voltmeter.

13. Derive the expression for the force between two parallel, current-carrying conductors.

14. Give an account of magnetic Lorentz force.

16. Derive the expression for the force on a current-carrying conductor in a magnetic field.

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UNIT 4: ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT

Short Answer Questions

1. What is meant by electromagnetic induction?
2. State Faraday's laws of electromagnetic induction.
3. State Lenz's law.
4. State Fleming's right hand rule.
6. Mention the ways of producing induced emf.
8. What do you mean by self-induction?
10. What do you understand by self-inductance of a coil? Give its physical significance.
11. What is meant by mutual induction?
12. Give the principle of AC generator.
14. What are step-up and step-down transformers?
15. Define average value of an alternating current.
16. How will you define RMS value of an alternating current?
19. What do you mean by resonant frequency?
20. How will you define Q-factor?
21. What is meant by wattles current?
22. Give any one definition of power factor.
23. What are LC oscillations?

Long Answer Questions

4. Obtain an expression for motional emf from Lorentz force.
9. Show that the mutual inductance between a pair of coils is same (M_{12} = M_{21}).
11. Show mathematically that the rotation of a coil in a magnetic field over one rotation induces an alternating emf of one cycle.
15. Explain the construction and working of transformer.
16. Mention the various energy losses in a transformer.
18. Find out the phase relationship between voltage and current in a pure inductive circuit.
20. Define inductive and capacitive reactance. Give their units.
21. Obtain an expression for average power of AC over a cycle. Discuss its special cases.
23. Prove that the total energy is conserved during LC oscillations.

UNIT 5: ELECTROMAGNETIC WAVES

Short answer questions

1. What is displacement current?
2. What are electromagnetic waves?
3. Write down the integral form of modified Ampere's circuital law.
4. Write notes on Gauss' law in magnetism.
5. Give two uses each of (i) IR radiation, (ii) Microwaves and (iii) UV radiation.

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7. Write notes on Ampere-Maxwell law.

8. Why are e.m. waves non-mechanical?

Long answer questions

1. Write down Maxwell equations in integral form.

2. Write short notes on (a) microwave (b) X-ray (c) radio waves (d) visible spectrum

6. Write down the properties of electromagnetic waves.

8. Explain the types of emission spectrum.

9. Explain the types of absorption spectrum.

UNIT 6: RAY OPTICS

Short Answer Questions

2. Derive the relation between f and R for a spherical mirror.

5. State Snell's law/law of refraction.

8. What is relative refractive index?

9. Obtain the equation for apparent depth.

10. Why do stars twinkle?

11. What are critical angle and total internal reflection?

12. Obtain the equation for critical angle.

17. How does an endoscope work?

18. What are primary focus and secondary focus of a lens?

22. What is power of a lens?

24. What is angle of minimum deviation?

25. What is dispersion?

26. How are rainbows formed?

27. What is Rayleigh's scattering?

28. Why does sky appear blue?

29. What is the reason for reddish appearance of sky during sunset and sunrise?

30. Why do clouds appear white?

Long Answer Questions

1. Derive the mirror equation and the equation for lateral magnification.

3. Obtain the equation for radius of illumination (or) Snell's window.

5. Obtain the equation for lateral displacement of light passing through a glass slab.

6. Derive the equation for refraction at single spherical surface.

7. Obtain lens maker's formula and mention its significance.

9. Derive the equation for angle of deviation produced by a prism and thus obtain the equation for refractive index of material of the prism.

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